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Manufacturers' Cooperative Sales Activities

By W. E. Derwent

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OUR ASSOCIATION representing all leading manufacturers of gas appliances, accessories and equipment in this country has recently held its fifth annual meeting in Atlantic City, New Jersey and is now embarking on the sixth year of service to the gas industry.

As trade associations go, we are relatively new but we feel that in the few years of our existence that we have accomplished much and proven the need of a trade organization for the manufacturers. As an association, our original objectives as stated in our constitution and by-laws, were through whatever methods were fair and practical, to increase the use of gas as a fuel, to better relations with our customers and our outlets and create greater public acceptance of gas as the ideal fuel. To accomplish these objectives, we have resorted in a large way to cooperative sales promotion programs. Let me review these briefly.

Servel Incorporated, through the Gas Refrigerator Division of A.G.A.E.M. and the Gas Refrigeration Committee of the American Gas Association, is now engaged in their eighth consecutive sales promotion effort. This year's campaign in particular was set up to cover the entire twelve months of 1940 and in this way differs from the previous campaigns that were designed to cover the peak selling seasons for this type of appliance. From all indications this will be their most successful campaign and sales will exceed those of last year. We should realize that it is difficult for any individual organization to sponsor sales contests year after year and still succeed in arousing the same enthusiasm as was engendered in previous years. The success of this year's campaign is high tribute to those responsible for developing a sales program that is basically sound and contains a sufficient number of new features to make it appealing and profitable for distributors, dealers and salesmen engaged in the sale of gas-fired refrigerators.

C P Range Campaign

The "C.P." gas range is by this time of nation wide prominence. This symbol and the trade-mark "Certified Performance" have achieved an encouraging amount of consumer recognition, and the momentum of their acceptance by the buying public is increasing from day to day. I would like to review in a few words the origin and development of this quality gas appliance. The program originated in 1938 and was sponsored at the outset by a small group of gas range manufacturers. The original budget for the promotion of the "C.P." gas range was, of course, relatively small but by this year had increased to $110,000 and had earned the support of twenty-six leading gas range manufacturers. Sales of gas ranges bearing the "C.P." symbol will approximate 100,000 units for the year 1940, and roughly by the end of the year there will be 250,000 of these quality appliances in operation and contributing to the comfort and convenience of the same number of housewives and families.

The moneys raised by the sponsor manufacturers since the middle of 1938 have been expended in various channels. The cooperation of gas utilities and retail dealer outlets has been aggressively solicited through appropriate sales promotion literature, and sales counsel has been widely disseminated by the staff of the Domestic Gas Range Division of A.G.A.E.M. The number of meetings of gas company salesmen, of dealer groups, of conventions and other gas industry gatherings that have been addressed by the members of this staff, are far too numerous to attempt to give you a definite number. I believe the familiarity of the people in the gas industry with the activities of these industries will suffice in place of a definite number.

The program planned for 1941, although not in its final form, will be just as intense and perhaps of even greater coverage than the 1940 effort. You can be sure that we will not relax our efforts to maintain and even increase the acceptance of gas and the modern gas range as the

Mr. Derwent, in this article, sums up briefly the cooperative sales activities of A.G.A.E.M. and outlines some of the major plans for 1941.

ideal requisites for cooking in the American home.

Gas Water Heaters

The Gas Water Heater Division of this association has likewise sponsored cooperative sales programs for the past five years and the increasing volume of gas water heater sales will justify every dollar that has been contributed to these activities. These contests have varied from year to year in their nature and have involved cash prize campaigns, merchandise prize contests, the preparation and dissemination of sound sales promotion material, the production and use of a colorful sound slide film, etc. The amount of money raised by sponsors for individual years' activities have fluctuated but have gone as high as $100,000. A rough estimate of the total amount spent in cooperative effort over the past five years would exceed $250,000. Add to this the amounts expended by individual manufacturers in localized sales effort and one can easily understand why gas water heater sales have recorded such consistent progress.

Next year's program is still in the formative stage but under the able leadership of the sales promotion committee of this division, I feel certain that another effective program will be forthcoming.

House Heating

Up to the present time, the gas house heating division of our Association has been relatively dormant insofar as cooperative sales programs are concerned. This picture may change radically in the coming year. In the early months of this year a leading gas utility, after considerable research and investigation, succeeded in producing a set of standards covering the quality of gas furnace equipment and its installation. The complete set, operating under the name of "C.Q." heating program was made available by this utility to the gas house heating division. Since that time considerable progress has been made toward incorporating the details of this local program into a national program. At the meeting of this division in Atlantic City in October, preliminary steps were taken in the direction of securing the sponsorship of interested manufacturers and setting up appropriate committees to investigate and develop requirements covering the equipment and its installation that might be promoted on a national basis. Twelve manufacturers agreed to contribute to the raising of an amount of money that would finance the expenses of this initial investigation and development.

Of course, it may be some time before this work is completed. The problems that will confront committee members are numerous and complex inasmuch as they will have to deal with many different sets of national and local requirements and countless city and state ordinances regulating the quality and installation of their appliances. We feel that the committees representing this division are fully capable of overcoming these obstacles.

So far I have discussed only the sales promotion activities of gas appliance manufacturers. I must now digress to other important activities of our organization which have likewise contributed greatly to the progress and knowledge of our industry.

Statistics

Statistical data on production and sales are vital to any industry and this applies equally as well to the gas appliance industry. We should be able to compare our individual business with the industry volume and we should likewise know how our product is faring as compared to products using competitive fuels. Our individual volume may be increasing at a satisfactory rate but if our industry as a whole is not maintaining or increasing its share of the total market available, this news is likewise of importance to us. Generally speaking, one company is only as strong as the other units in the industry.

Our association headquarters now furnish monthly summaries containing industry production and shipment information on gas ranges, gas water heaters, gas house heating equipment and gas-fired steam radiators to all manufacturers who contribute their individual data. The summaries are likewise made available to interested manufacturers of accessories, etc.

Quarterly bulletins containing information on the gas appliance industry and competitive fuel appliance industries are likewise circulated to reporting manufacturers, a selected list of gas utility executives and to libraries, banks, investment houses and other interested institutions. One can readily understand why these institutions might be interested in statistical data on our industry, and we of course are happy to be in a position to supply them with it.

Another source of comparison for the individual manufacturer with his industry as a whole is the compilation and distribution of average financial ratios. Our statistical department has just completed its first survey of this nature and this survey has been distributed to all manufacturers who contributed their individual financial ratios for the year 1939. It is planned to make this an annual activity and in succeeding years this information will be available not in November but sometime around May of the following year.

Bottled Gas Market

A relatively new market for manufacturers of gas appliances is the so-called bottled gas market, and the first definite effort has now been made towards securing data on its extent and possibilities. The gas range monthly report forms are now broken down to provide for the reporting of information on shipments of ranges for use with this particular kind of gas. Beginning in January, 1941, our monthly summaries will record this industry information. A six months 1940 summary has recently been completed and mailed to the 21 manufacturers representing approximately 53% of the total national business, who were able to review their records and supply monthly data for use in the preparation of this summary. I feel that the information contained in this tabulation will amply repay all contributing manufacturers for their efforts.

As a source of general information on statistics in our industry, the headquarters staff is always available and willing to disseminate data to allied groups and other parties interested in the position of the gas industry.

Cooperation

Our product divisions cooperate very closely with the American Gas Association and the A.G.A. Testing Laboratories through manufacturer representatives on the various requirements committees of the laboratories. Each gas appliance group maintains its own appropriate subcommittees and it is the work of their subcommittees which is in a great measure responsible for the continued development, and improvement that has been made in the appliances using gas as a fuel, which have been placed on the market in the past several years.

Various product divisions of our Association through their committees are now working very closely with numerous governmental agencies that are engaged in the development of specifications covering appliances to

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The Gas Industry's Opportunity In National Defense

By
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and
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FIRST and foremost of all problems confronting this country today is that of National Defense. Those of us here today are concerned with it in two respects; first, as citizens for what we may expect in the way of protection and preservation of our democratic ideals; and secondly, as members of a great industry that will play a most important role in the preparation and development of the Defense Program.

One may think the responsibility of the Gas Industry rests in ample production and the continuance of good service that so characterizes its performance during peace times, but these same qualities will apply with even more emphasis in these times of emergency. Sabotage and damage to our plants are now factors to be considered in light of the present situation. As far back as 1935, Germany recognized this situation, and through constant rehearsals with picked personnel for specific duties, developed production and service plans and enacted the roles for the maintenance of supply and service. Let us be prepared, likewise, for any similar emergency.

However, our responsibilities do not end here. Not only our responsibilities, but our opportunities extend far beyond this point. We must extend our facilities and our personnel far beyond that required during peace time. The National Defense Program is an additional requirement to be carried without any sacrifice to the requirements of normal times. If this Defense Program is to be successful, it is reasonable to assume that each cubic foot of gas, each individual employee, and each dollar of expense must produce greater results than ever before, and these results must be accomplished with the ultimate expediency.

Speed and a greatly accelerated tempo will be the theme from now on. Men of broader vision, of more creative imagination, and of greater ability, are more than ever required.

Our industry is a most important one; without it the Defense Program, unquestionably, would be less successful. Because of this fact, we should all embrace enthusiastically the great opportunity that lies ahead of us and assume more than our normal responsibilities in this emergency. Patriotism means sacrifice, and political and economic consideration must be fair and just. This is all the Gas Industry expects in return for the fine contribution it is making, and will continue to make

FRANKLIN T. RAINEY

toward the building of a program that will assure to all peoples in this country the three cardinal points of industrial and national freedom: first, representative democracy; second, civil and religious liberty; and third, free private enterprise.

The magnitude of such a program, already earmarked by expected appropriation of some thirty-six billions of dollars during the next five years, is truly difficult to realize. But it is a reality, and in it we have a definite assignment to perform.

Our greatest contribution will be that of not only furnishing gas to industry, but developing and assisting industry in new and better ways of utilizing our product. This then, will be a cooperative assignment, involving the combined personnel of three great industries; the gas industry, through its industrial sales engineers, the gas equipment manufacturers, and all industries making any specific defense product must all combine their talents to effect with speed and efficiency the desired results.

This being the case, how well qualified are we for such a role? Have we kept pace with industry? Is our industrial personnel qualified for such an undertaking? Do gas appliance manufacturers have the required equipment? Is there understanding and confidence among the three interested parties?

I am sure all these questions can be answered in the affirmative, but let us analyze a little and see what has been accomplished since the last war, so that we can, perhaps, project the results and accomplishments that may be expected in the program that lies ahead of us.

Progress in Equipment and Personnel

During the last war, no trained industrial personnel existed in the Gas Industry. There was no gas-fired equipment, utilizing gas as a fuel, as we have today. Industry used gas fuel, but by means of any make-shift method that could be figured out at the time, by men totally unprepared by experience or training for an assignment of such magnitude and importance. Efficient heating methods and applications had not yet been evolved.

Today, because of systematically planned and far-sighted policies adopted by most gas companies, we are fortified with thousands of trained and experienced industrial engineers with well established contacts that have won the trust and confidence of industry. This is not the result of the hysteria of the moment, but rather the result of patient and thoughtful consideration to this policy over the last twenty years, enabling us to understand and help

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solve the many problems of our customers. This has merited and won the customer's confidence to the extent that now he not only solicits, but expects and demands this assistance in solving his industrial heating problems. The importance of such a changed situation is perfectly obvious to all, and as proof and evidence that it actually exists, may I remind you that although the business index today is far below that of 1929, Industrial Gas Sales are 50% greater than in 1929.

Through cooperation between the Gas Industry and gas equipment manufacturers, there has been developed since the last war, superior methods and heating equipment for industry. These have resulted in the wider availability of better steel, bronzes, and other metals than were formerly obtainable. We now have the inert atmosphere furnaces, with many types of atmospheres, which permit the maintenance of bright surfaces for metals, the reduction of surface oxides on metals, and prevent decarburization, or softening, of metal surfaces. There has also been developed, furnaces for carburizing, or hardening, metal surfaces, using gas not only as the source of heat, but also as the hardening agent. In addition, there have been developed many types of continuous furnaces, with heat resisting alloy mechanisms for conveying materials through furnaces operating at high temperatures, under accurate temperature control, exact fuel proportioning, and producing definite results. Through these various combinations, there has been opened to gas new fields of chemical and physical applications, aside from its use as a source of heat. All of this means a greater production of superior materials at less cost. Have we in the gas business kept pace with industry? My answer is definitely *Yes,* and with all modesty, we can claim a major share of the credit for the improvement of heating methods and equipment found in industrial use today.

How, then, will gas and such equipment be used in furthering additional values in this program for National Defense? The scope and multiplicity of its application is truly staggering to the imagination. Thousands upon thousands of defense products will be dependent in their making upon gas. In fact, there will hardly be an article made, regardless of size, that has not undergone some gas heating application.

To enumerate them would be an endless task, but I would like to bring before you some of the more unique and interesting applications, showing the versatility of this fine product of ours. Needless to say, it should be apparent to all here that I cannot be specific in names, processes, or statistics, for many of these are closely guarded secrets by all interested parties.

Broader Uses of Gas

In the expanding and new army training areas, gas will be required for cooking, baking, water heating, and other operations necessary for the production of food for this ultimate army of three and a half million men. Gas will be used in the preparation of both the canned and packaged type foods. Gas will heat the water and cleaning solutions, and do the singeing to prepare wool to supply thousands of blankets to the Army, while it will burn the clay or process the metal for thousands of dollars worth of eating utensils for the Navy. Gas will be the fuel in the huge clothing depots for steaming and processing cloth for uniforms. From the first thing the soldier puts on in the morning, his shirt, which required gas for tentering, singeing, processing, and ironing, to the bedspring on which he lies at night which has been processed and tempered with gas, he will come in contact throughout the day with article after article made serviceable because of gas applications.

Gas will have put into his rifle, through many delicate heating operations, those exacting qualities that make possible the expert marksman.

Gas will activate the carbon, or absorbing agent, in his gas mask and produce the glass for his goggles.

Gas will be required for melting, forging, nosing, and heat treating all sizes and types of shells so as to increase their range of fragmentation for greater destructiveness, and gas will put into the anti-aircraft guns those qualities for speed and precision upon which their success depends. For the huge sixteen-inch guns, it will be gas that so toughens and hardens the metal to make them capable of sending 3,000 pounds of steel and explosives thirty miles through the air with unseeming accuracy.

The building of all materials for communication and control equipment will require huge quantities of gas to insure their good performance.

From bombs of all types to the destructive torpedo, gas performs many roles in their production.

Gas Byproducts

In the chemical field, the gas industry will provide many of the materials required. As a by-product of manufactured gas, the most obvious war materials are the explosive bases, toluol, and other benzene homologs. Research is now being conducted on the nitration of paraffin hydrocarbons that may lead to commercial exploitation of explosives said to be far superior even to T.N.T. Also, the availability of chloropicrin, which serves as a linking agent for other chemicals, and in itself a fine lethal gas, may find an increasing use in the field of munitions.

Gas As Industrial Fuel

Gas will be required for heating stills, retorts, etc., for the production of nitrous oxide, tear gases, ether, and other chemicals. Gas is almost the sole fuel in the chemical plants producing pure molybdenum and pure tungsten. A new and important development is the production of beryllium oxide and alloying it with copper to give copper the properties of hardness and resiliency equal to that of heat treated carbon steel. Because of its physical and chemical characteristics, it causes no sparking under abrasion and, therefore, is an all-important attribute to safety where explosive materials are processed. In certain stages of munition manufacturing, much of the explosive hazard has been removed, thanks to beryllium copper, which is prepared exclusively with natural gas.

The latest and closest artificial approach to daylight is with the use of fluorescent bulbs. Many armament operations are carried out under the soft effective light emitted by these bulbs, and, indirect though it is, gas has made an important contribution because the bulbs have been coated with beryllium oxide.

No article of war has so intrigued the imagination as the modern tank. This movable fortress, capable of travelling at speeds of 40 to 60 miles per hour, must have great destructive dealing qualities in offense, and yet on defense, be able to resist and withstand these same agencies of destruction. Built almost entirely of metal, nearly all parts will have received some form of heat treatment by gas. The tank interior mechanisms will follow much of the accepted gas applications found in the modern tractor or automobile, although on a more extensive scale because of the greater requirements needed for

meeting the more rigid specifications. But its ability to resist modern type warfare will depend upon its armor plate shell. This armor plate must be tremendously hard on its outside surface to resist artillery fire, but its inside surface must be tough and resilient, to prevent shattering. The one fuel that makes this possible today is gas. Gas not only provides the fuel for some fifteen different heating operations to which the armor plate must be subjected, but also, through chemical action of its carbon contents with the steel, it furnishes that required hard surface to a thickness approximately ten times greater than any similar surface requirement needed in any product of commercial life today.

To approach this quality of product in the last war would have required a heating cycle from 400 to 600 hours in length. Today—thanks to the gas industry's research over the last few years, we are in a position to accomplish a far superior result in approximately 100 hours.

You may be interested in a rough estimate of the amount of gas required for the many heating operations involved in the production of a tank. For a medium size tank, approximately 500,000 cubic feet of manufactured gas equivalent will be required, and since a production of 200 to 300 tanks a day is being considered to meet our requirements, the magnitude of this potential load is apparent.

And in Aviation

The manufacture of an airplane is a continuing process of thousands of gas applications. Steel tubing for axles, struts, motor mountings, and fuselage is necessary and of such characteristics that weight, wind resistance, etc., must be at a minimum. Through various heating operations with gas, this tubing finally goes through a modern controlled atmosphere furnace in which gas is again not only the heating medium, but also furnishes that furnace atmosphere to produce the required product—a process unknown ten years ago—today, indispensable in aircraft manufacture.

Here again, the cockpits and other vital parts of a plane will carry armor plate, less in thickness than the tank, but produced exactly as before—with gas.

Propellor production will require large quantities of gas, not only in their production, but in their refinement. One very recent refinement is that of molded rubber ends for propellers. This consists of taking rubber, impregnating it with nitrogen at extremely high pressures, and subjecting it to gas heat for several hours. This product is said to give better bite and better feathering action to the propeller, resulting in better plane performance.

Besides the requirements of gas for plants engaged in airplane building, enormous quantities of gas will be required by those concerns taking subcontracts on aircraft business. To indicate the enormity of subcontracts of this type, a modern bomber will require from 400 to 600 sub-contracts for the furnishing of parts and equipment, almost all of which will utilize gas in their process of manufacture.

For Naval Construction and Equipment

One of the largest users of gas, either directly, or indirectly, are those industries engaged in making naval equipment. Shipyards will require tremendous quantities of gas for shaping, annealing, and tempering the many tons of steel, copper, and other metals that go into the construction of a modern fighting ship, and also for the fabrication of the intricate piping systems ranging from ¼" up to 24" in diameter and miles in length, connecting all compartments on the decks and from stem to stern. In these shipyards will be found gas-fired furnaces, ranging in size from an ordinary shoe box for soldering and rivet heating, up to the size of a fifty room house for the annealing of a complete gun turret 50 feet in diameter, weighing 40 tons, and operating at 1200° temperature. This operation extends over a period of 200 hours and will use over 1,000,000 cubic feet of gas for each anneal. These furnaces are the largest in the world, and when not in use for annealing, they are equipped with gas-fired unit heaters and used as a shop, believe it or not!

The North Carolina has three triple turrets, each mounting three sixteen-inch guns, and is the first capital ship built for the Navy in nineteen years and the forerunner of a fleet of eight new capital battleships. Forty million cubic feet of gas were required in the building and assembling of this ship of 35,000 tons at the Navy Yard. The keels of two 45,000 ton battleships will shortly be laid down and these will require even additional quantities of gas.

In addition to these amounts, must be considered the great quantities of gas that will be needed in making the many parts and articles of equipment that go into these battleships that will be sub-contracted and made elsewhere. Guns, control equipment, armor plate, and the many other necessary articles will require literally thousands of millions of cubic feet of gas in their manufacture.

In the manufacture of many types of instruments used in articles of war, accurate control of humidity is essential. Through the development of gas-designed air conditioning equipment now available, this accurate control has become a reality.

I could continue citing example after example of gas applications and the part they play in the production of material for our Defense Program; yet I would probably never reach the end, for while I am here talking to you, new methods and applications are being developed and put into operation, and will continue just so long as our industry is a progressive industry. The one big point is that with the development of radiant tube and convection heating, prepared atmosphere, and refinements in gas fuel applications and controls, gas now surpasses any heating medium in accuracy of temperature control, uniformity of heating, atmosphere control, heat distribution, and speed. These qualities are of primary importance in our National Defense Program. Price is of secondary importance.

Summary

In summation, we therefore may say quite definitely that the Gas Industry is prepared to play and, indeed, is now actually playing a far more extensive and more important role in this Program of National Defense than it did in the previous war. During the twenty odd years that have intervened, we have brought to realization a program of steady and continued progress. Then we had

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Experience at Norwich with Ignition Dome Carburettor Using Heavy Oil

By
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Gas and Electrical Department

IN 1938 it became evident to us that it would be necessary to take drastic steps to decrease production costs at our plant. This necessity was dictated by the fact that raw materials were on an upward price trend, our light tar market was falling off, and our output of gas for industrial purposes was on the uptrend. All of these factors combined made it imperative that careful consideration be given to the use of Bunker "C" Oil for enrichment purposes.

In as much as we had adequate storage capacity for finished tar, a tar dehydrating plant, and sufficiently large tar separators, the problem was fairly simple. The problem of heavy tar disposal presented no difficulties as we have a combination oil-fired and Waste-heat boiler. Unless we could get an attractive price for our heavy tar we were prepared to use the heavy tar as a fuel in our boiler.

From our study of the problem it was decided to convert our 7'-6" standard backrun Gas Machinery set to the use of heavy oil by the installation of a Semet-Solvay Ignition Dome.

Work was begun on this change in October, 1938 and the set was put into service early in December of the same year.

Description of Changes to Set:

1. *Generator:—*

An Anthony water-cooled oil spray was installed in the generator dome, set so as to spray oil obliquely down on the fire, and so located as to be easily accessible from the operating floor.

2. *Carburettor:—*

All checkers were removed from the carburettor, and an ignition dome was installed. The ignition dome is most simply described as a 9" thick, flat, annular section built at right angles to the vertical axis of the carburettor at a point level with the bottom of the generator-carburettor connection. The round opening in the center of the dome is flared toward the bottom of the carburettor from a diameter of 24" at the top face of the dome to a diameter of 36" at the bottom face. On the top face of the dome, four brick piers were placed, extending to the underside of the main carburettor dome. The purpose of these piers is to break up the flow of the blue gas from the generator, and direct it through the nozzle in the dome.

An Anthony water-cooled oil spray was installed in the center of the carburettor three feet above the carburettor bottom. This spray directs the oil upward in the carburettor, counter-current to the blue gas. The spray is easily removed through the side of the carburettor shell for cleaning.

An additional clean-out door was installed at the bottom of the carburettor to facilitate the removal of accumulated carbon. The carburettor air is admitted through the top of the carbuettor dome and is controlled by a creeper valve.

3. *Superheater:—*

A new set of arches was installed in the superheater, located three feet above the existing arch blocks. The bulk of the superheater checkers are therefore supported on the upper arches, while only four rows of checkers are placed on the lower blocks. In this manner the first four rows of checkers takes the bulk of the carbon deposit and can easily be replaced when necessary without disturbing the remainder of superheater checker brick. We have removed old checkers and replaced new checkers in this lower section in the ordinary course of generator clinkering shutdown periods.

4. *Wash Box and Three-Way Valve:—*

A cone bottom addition was made to the existing wash-box for the purpose of more easily handling anv accumulations of heavy tar. We feel that this additional investment was well worth while, as we have been able to keep ahead of any accumulations of tar which would lead to annoying consequences.

Five additional sprays were installed in the three-way valve assembly, and one each in the backrun connection and superheater connection to the three-way valve. The use of these sprays has contributed much to keeping heavy accumulations out of the three-way valve assembly.

5. *Bunker "C" Oil Handling System:—*

A 50,000 gallon tank is used for the storage of Bunker "C" Oil; and through the use of vertical banks of coils and exhaust steam, the oil is heated to 120° F. at the outlet of the tank. This is sufficiently hot to allow for easy handling by the pumps. From the Bunker "C" pumps, the oil passes through a primary heater which heats the oil to about 275° F. This oil is stored in a 100 gallon hot-oil tank from which point it enters the oil sprays. All oil sprays are also equipped with steam purge units.

Gas Making Materials:

1. *Oil:—*

The Bunker "C" Oil having the following approximate analysis is used.

Gravity	**14 A.P.I**
Flash Point	**200° (plus)**
Viscosity	**55 Sec. @ 122° F-S.F.**
Conradson Carbon	**9.1%**
Pour Test	**30° F.**
B.T.U. per Gal.	**152,000**

2. *Coke—Dry Basis:—*

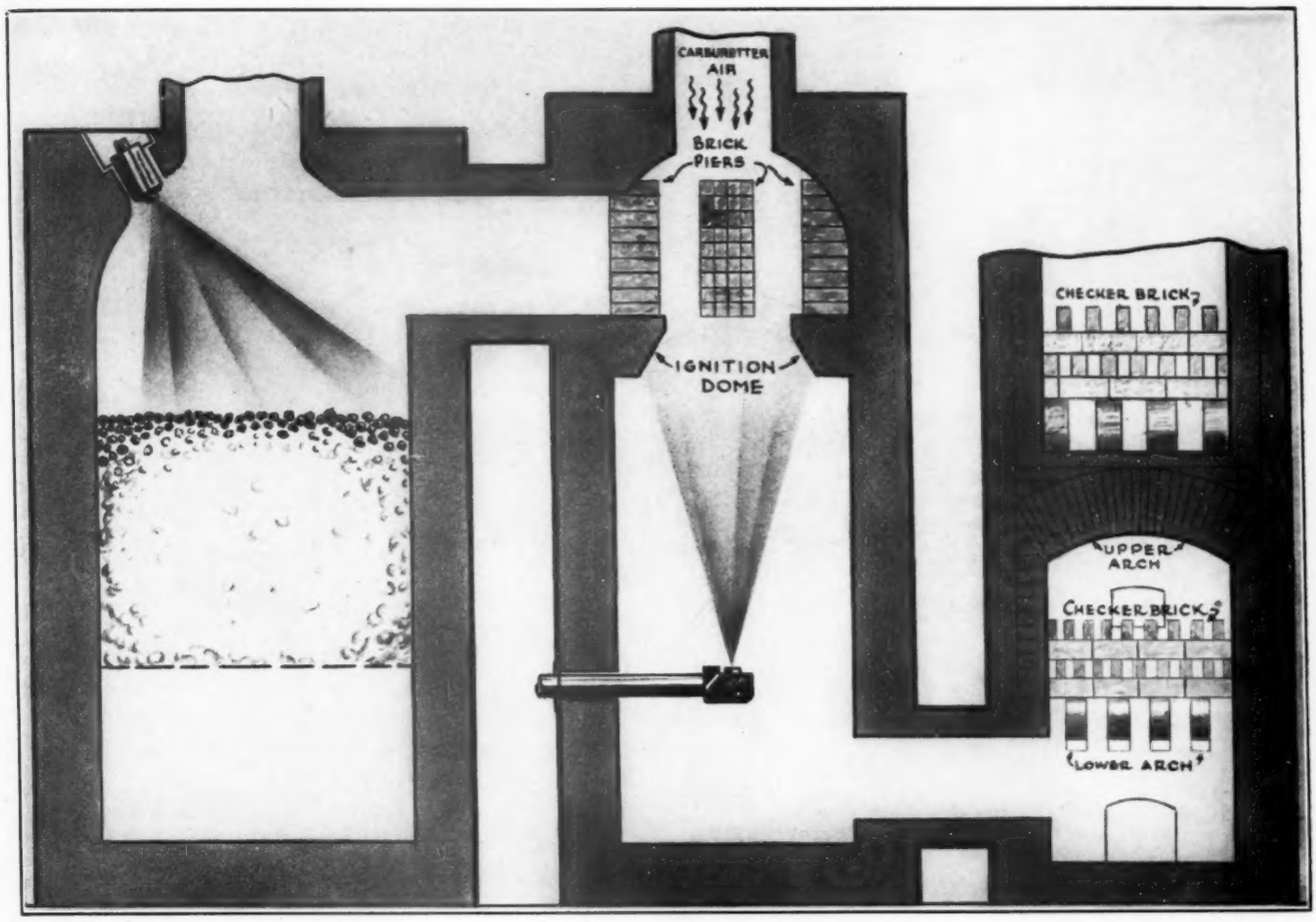
B.T.U. per Lb.	**13,550**
Fixed Carbon	**91.22%**
Ash	**7.11%**
Volatile	**1.67%**
	100.00%

Size ..... **Stove**
Type ..... **Vertical Coke Oven.**

Operating Cycle—Twenty Percent Reforming:—

Uprun—120 Seconds.
Uprun Oil 80-90 sec. admission time.
Backrun—80 Seconds.
Reform Oil 35 Sec. admission time.
Uprun Purge—10 Seconds.
210 Seconds total running time.
Blow-down—(0-10 Sec.) adjusted to maintain 0.63 gravity.
Average blowing time 2.4 minutes.

Presented before New England Gas Association, Operating Division, Hartford, Conn., October 23, 1940.



Operating Procedures:

Due to the fact that we have ample gas storage capacity, it is only necessary for us to run an average of 12-13 hours per day. At times it has been possible to run two days without clinkering the generator, but as a rule the generator is clinkered every morning. The clinkering time varies from 60-90 minutes.

Carbon deposits vary with the type of oil used. With a 9.0% carbon oil very little trouble is experienced with carbon deposits in the carburettor. We can keep ahead of large deposits by cracking the lower door in the carburettor and opening a vent in the top of the carburettor air inlet tee. This procedure allows a draft of air to pass up through the carburettor during the shut down period and effectively burns out a large proportion of the carbon on the walls. About every third day the carbon is removed from the bottom of the carburettor. We have found that by sprinkling coke on the carburettor bottom it is much easier to remove the carbon. The coke prevents the carbon from sticking tightly to the bottom and the carbon can easily be broken out with bars.

Operating Period		*Coke per M.C.F.*	*Bunker "C" Oil per MCF.*	*Per Cent Reform*	*Average Hourly Make*	*Steam*		*Pounds per MCF. Made*
Mos.	*Hrs.*	*Lbs.*	*Gals.*		*MCF*	*Up-steam pounds per min.*	*Back-steam pounds per min.*	
11	3200	18	4.45	24%	55	58	41	32
10	2500	20	4.00	15%	55	58	41	32

The carburettor oil spray is removed once a week and thoroughly cleaned. We have found it necessary to remove the generator spray only once in three months, on the average. The three-way valve and its connections are cleaned after each operating day. The wash-box and seal pot are flushed out every day.

Operating Results - 530 B. T. U.

Our set maintenance, as far as refractories is concerned, has been materially decreased through the use of the checkerless carburettor and the installation of the arch in the superheater. The four rows of checkers in the bottom are designed to take the bulk of the carbon carried over, but we have found but very little carbon deposit on these brick. The principal cause for removal is that their heat absorption property has been destroyed. We have found that approximately 20% longer life has been obtained from the superheater checkers due to the arch installation in the superheater.

Conclusions:

The installation of the ignition dome, and the use of heavy oil has increased our production capacity from 48MCF per hour to 55MCF per hour. It is possible to increase this capacity by 5 MCF per hour if we were not limited by the available capacities of the auxiliaries.

The quality of the Bunker "C" oil used, is a critical factor in obtaining maximum results. In our particular case an oil containing over 9.1% carbon causes increased carbon deposits in the carburettor.

After two years experience with the ignition dome we feel that it has satisfactorily fulfilled expectations, with a minimum investment.

State Compensation Award To Injured Employes Is Valid

By
Leo T. Parker
Attorney at Law
Cincinnati, O.

IT IS WELL KNOWN that under the old or common law all gas companies stand liable to pay heavy damages to injured employes. Of course, under these old laws no employe could recover damages unless the testimony proved that the injury resulted from some form or degree of negligence on the part of the employer. Moreover, if the injury was caused by failure of the employe to use ordinary care to safeguard himself, the employe could not recover damages, or other compensation.

However, our own modern Workmen's State Compensation Laws enable gas company employes to recover compensation for any injury sustained while "in the course of the employment", irrespective of whether the injury resulted from negligence of the employer or carelessness of the employe himself.

The important advantages of these modern compensation laws are: First, the employe is assured payment of reasonably adequate compensation, in consideration of the seriousness of the injury; and, second, employers are relieved from payment of damages to injured employes. Obviously, this latter advantage is especially important, because in numerous situations gas companies have saved thousands of dollars which, under the common law, they would have been compelled to pay in damages to injured employes.

However, present circumstances are numerous under which gas companies still, under the modern compensation laws, may be compelled to pay damages to injured employes. And, conversely, circumstances frequently exist under which the employe cannot recover compensation.

Therefore, the purpose of this article is a review of late and leading higher court cases, involving gas companies, which clearly illustrate the legal dividing line between when a gas company employe may, and when he may not be entitled to recover state compensation.

Employee Must Prove Injury

The test adopted by the courts for determining whether an employe is at a given time in the course of his employment, is whether the employe was at the time engaged in the performance of the duties required of him by his contract of employment; or by specific direction of his employer; or whether he was engaged at the time in the furtherance of the employer's interest.

Another important point of established law is that a period of rest, refreshment, or other *temporary* cessation from work is not sufficient to break the continuity of employment. However, an independent act of a gas company employe which has *no* relations to the employer's interest, serves to break the so-called nexus and to put the employe outside the course of the employment, whereby he cannot recover compensation under state compensation laws for the injury.

Furthermore, an employe who sues to recover state compensation is bound to prove that he was injured while working for his employer.

For illustration, in Lee v. Memphis Natural Gas Co., 197 So. 638, reported September 12, 1940, it was shown that an employe of a gas company filed a suit for compensation and alleged that while he and other workmen were engaged in removing a railroad track which had been laid for temporary use by his employer, he slipped and fell on the track, seriously injuring his back and spine and had been unable to work since the said accident.

The counsel for the gas company contended that the employe did not receive any back injury while on this particular job. The employe failed to prove by other workmen that he had received the injury. Also, he failed to prove by physicians that his back was injured. Therefore, the higher court refused to allow compensation, and said:

"As in most compensation cases, only questions of fact are involved and the great preponderance of medical testimony is against plaintiff (employe) and there is no lay testimony to support his contention. We would be forced to take the testimony of one doctor over that of six or seven other reputable physicians to find that plaintiff received any injury to his back in the fall which he received."

Employer Sells Business

Another important point of law is that while a State Industrial Commission is authorized to determine a controversy between the injured employe and his employer, it is not authorized to determine a controversy between the employe and a third party who is neither the employer nor the insurance carrier.

For instance, in Independent Oil & Gas Co. v. Mooney, 103 Pac. (2nd) 557, reported, July, 1940, an employe filed notice of injury and claim for compensation in which it was stated that while engaged in hazardous employment with the Independent Gas Co., as a roustabout, he was seriously burned. During the trial it was shown that the settlement or payment of compensation to the employe was delayed until after the Independent Co. had entered into an agreement with the Phillips Petroleum Company, whereby all of the assets of the Independent Gas Co. were taken over and merged into the assets of Phillips Petroleum Co. Afterward the Industrial Commission awarded compensation to the employe against the Phillips Petroleum Co. The latter appealed to the higher court which promptly reversed the award, and said:

"It is first urged that the State In-

dustrial Commission erred in entering an award against the Phillips Petroleum Company. With this contention we agree. The State Industrial Commission is an administrative body, authorized and empowered to consider an injury arising out of and in the course of the employment as between the employer and employe. It has no power to consider and construe contractual rights between the employer or the insurance carrier of the employer and third parties."

Parking Lot Rule

Unless the gas company officials are familiar with the usual and regular conduct of employes, the latter are not entitled to recover state compensation for an injury received on a parking lot, although employes have been accustomed to park their automobiles on gas company premises.

For example, in Butler's Case, 145 Atl. 394, it was shown that employes usually parked their cars on a vacant lot in the rear of the employer's premises. One day an employe parked his car on a three-foot drop in the ground, and about 8 feet from the wall of the building. After the day's work the employe pulled up the emergency brake and proceeded to "crank" the car. The car rolled forward, took the drop, and pinned the employe against the building, effecting severe injuries.

The employe sued to recover compensation under the state compensation laws to which his employer had contributed for many years. However since there was no evidence that the employer had provided this place for the parking of cars by his employes and no evidence was given to prove that using this place for parking was customary among all of the employes, so that the employer was chargeable with knowledge of the practice, the higher court refused to allow the employe compensation, and said:

"There must be evidence that the accident arose out of the employment and it nowhere appears that the employer knew and allowed the practice of parking on its grounds."

Whether or not this injured employe sued and recovered damages from his employer for the injury is not disclosed. However, it is certain that if the employer had acknowledged that he knew the employes were using the lot for parking their automobiles, or if he had either verbally or in writing permitted his employes to use the lot for this purpose, this employe would have been awarded state compensation for the injury, and the employer would have been relieved from future liability.

Continuous Service

It is well settled law if a gas company employe is subject to call at any time for special service and he is injured while on the premises, or while he is coming or going to his home off the company premises, he is entitled to recover state compensation for the injury thus received.

For illustration, in Sullivan's Case, 164 N. E. 392, it was disclosed that an employe slept upon the company premises, in a room supplied him by the employer. One day the employe, after he had completed his day's work, proceeded to the room and was seriously injured when he stumbled and fell on an obstacle in the hall. The legal question arose whether the employer was liable in damages to the employe for the injury or whether, under the circumstances, he could recover compensation from the state for the injury. It is important to know that the higher court held the state bound to pay compensation to the injured employe, and said:

"The evidence of continuity of employment is not strong, but it is sufficient to establish the fact that the contract of hire included continuous service when needed."

Law of Working Place

Generally speaking, if an injury is sustained on the employe's "working place", he is entitled to recover compensation. From a legal standpoint the "working place" may be limited to a special room in a building including passage way to and from this room. On the other hand, this term may consist of the whole premises, including the building and the lot on which the building stands.

For instance, in Simonson, 219 N. W. 869, the important consideration of the higher court was whether an employe *not* making a trip to the company premises on a special call, could be held entitled to recover state compensation. This higher court held that unless an employe is traveling to or from the company premises on a special call, or the employe is being transported in a conveyance regularly furnished by the employer for the purpose of getting the employe to or from the place of employment, the injured employe must, in order to get compensation, have been on what is known as the "working premises". In many cases they may not extend outside the building in which the service is rendered. Doubtless, there may be cases where they will not include all of that building. On the other hand, in other instances the "working premises" include the building and the land on which the building is situated.

In Course of Employment

A gas company employe is within the scope or in the course of the employment and, therefore, entitled to recover state compensation for any and all injuries sustained during the time the employe enters the premises of the employer on his way to work and pursues the proper course to the place of his labor; while therein the performance of his duties as an employe; and until he has left the premises by the ordinary means of exit. It is important to know that there are numerous higher court cases which uphold the principle that the sphere of employment exists and affords its shield to the employe while on the premises of the employer on the way to or on the return from the actual performance of the specific duties of the employment.

Various higher courts have held that the term "in the course of" refers to the time, place, and circumstances, under which the accident takes place. It may be "in the course of employment," and yet the employe may be standing still and not physically moving in his work. He is still included when he does those reasonable things which his contract with his employer expressly or impliedly permits him to do.

On the other hand, various higher courts have held that if an employe is employed by a person who has no authority to hire employes such employe is not actually engaged and, therefore, cannot recover compensation for an injury.

For example, in Anschutz v. Gas Company, 142 S. W. (2nd) 11p, reported July, 1940, it was disclosed that a person named Anschutz went to the office of a Gas company and there filled out and filed, on a regular form, provided for that purpose, an application for employment. A few days later an operating foreman of the gas company, and who had no power to employ men, sent a message to Anschutz to come over and go to work. He received the message and went to the plant where he was given a physical examination. The next day Anschutz went to work and he was seriously injured. He sued the gas company for compensation but the higher court refused to allow the award, saying:

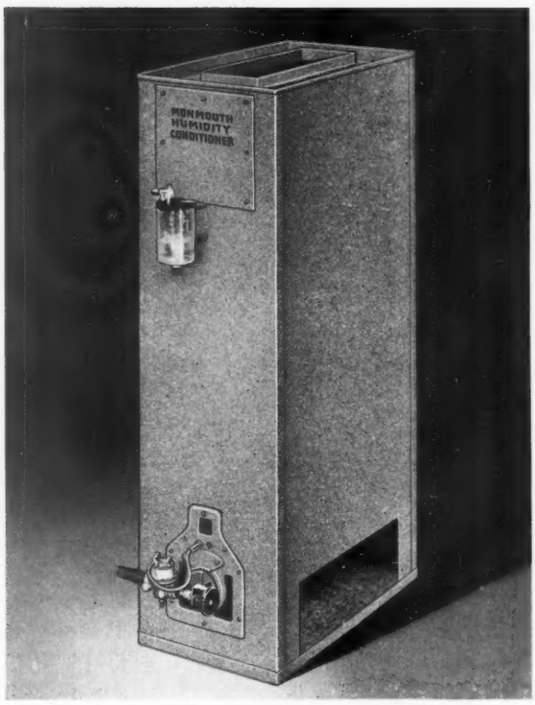
"Bickford (foreman) had no authority to hire in this case. At least the evidence supports such a finding of facts. In determining this question all of the facts and circumstances and the conduct of the parties must be taken into consideration."

Have You Seen This New Load Builder?

Another new and important field for gas is being opened by the Monmouth Humidity Conditioner — a gas-fired unit that for the first time brings proper humidification to radiator-heated homes. It is scientific, dependable, and easily installed; being independent of the heating plant.

The average heating-season consumption of this unit is about 20,000 cu. ft. of manufactured gas. *And it is salable.* The necessity for humidification is accepted. Never before has the radiator-heated home been offered a practical means of humidification. The fact that it is *needed* and *wanted* is borne out by the millions of dollars spent annually on gadgets and make-shifts. The market is ripe for a *practical* properly-priced humidifier and here it is.

THE NEW MONMOUTH HUMIDITY CONDITIONER



Size 10" wide, 17" deep, 35½" high.
Installation very simple.

Gas appliance sales managers, salesmen, and engineers are invited to write for complete information.

MONMOUTH PRODUCTS CO.

1939 E. 61st St. Cleveland, Ohio

MONMOUTH

The Greatest Name in Humidification

Sell Gas Appliances This Way

By
Arthur J. Larson

The first Glamour Kitchen of the Portland Gas and Coke Co. installed at Forest Grove, Ore. The town's most prominent women were invited to the first meeting.

DO THE WOMEN in your community use wood, coal or electricity to cook with? Are sales of gas ranges, refrigerators and gas water heaters tough to sell in the face of this competition? Then here is a story that tells you how to sell gas appliances, which has been highly successful in selling gas appliances in the Portland, Oregon area.

About a year ago R. G. Barnett, vice president and general manager, and John J. Winn, Jr., commercial manager, of the Portland Gas & Coke company, faced this problem. Gas appliance dealers in Portland, Forest Grove, Oregon, and Vancouver, Washington, reported that competion was tough. They said, "If there was only some way to get interest stirred among the women we know we could sell gas ranges, refrigerators and water heaters. What can be done?"

These two officials told the dealers that something would be done and that they'd be given every sales aid possible to help them get their share of the business.

"Some way to get women interested. Some place women could be brought together to see how efficiently gas appliances could serve them in their kitchens." That was the situation in a nutshell. So Mr. Barnett and Mr. Winn, Jr., cracked that nut through inaugurating Hospitality Houses in each of the above cities, with the result that today gas ranges, refrigerators and water heaters are sales leaders in those communities, and gas appliance dealers report nearly a 10% increase in all lines with women deeply interested in the plan. Seeing is selling, and here is how it was worked.

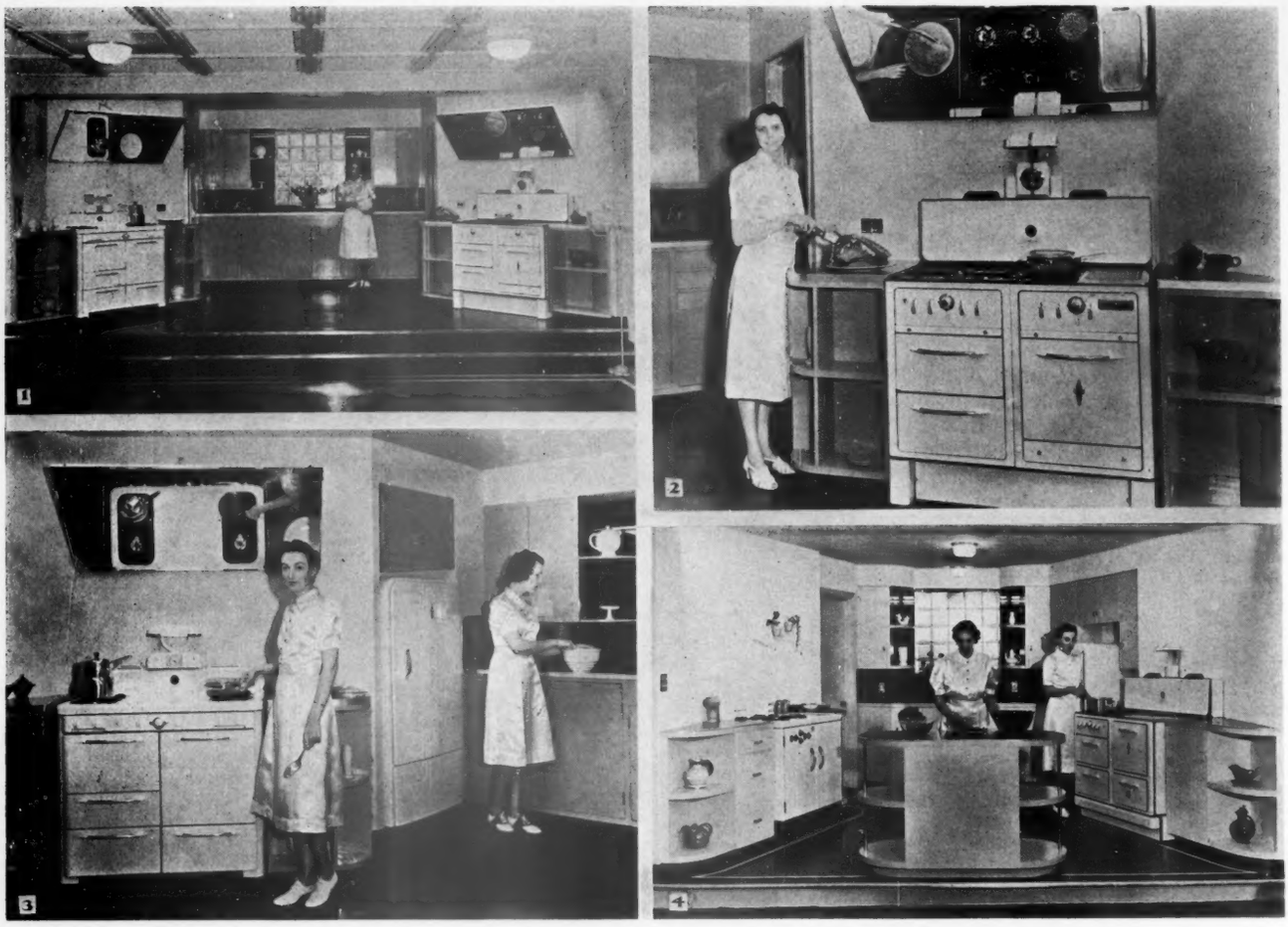
Hospitality Houses or rooms as they are called are really glamorous kitchens featuring the last word in C/P gas ranges, refrigerators and hot water heaters. At one end of these glamour kitchens upon a raised dais or platform about four inches above the floor level is a complete model kitchen. The rest of the room is an auditorium filled with comfortable chairs. These chairs are for the women to use for their own special meetings—meetings of clubs and organizations they belong to.

The first Hospitality room was installed in Forest Grove. The George Paterson Furniture company and the Forest Grove Hardware company, gas appliance dealers in that area, were asked for a C/P gas range, gas refrigerator and water heater to be used in the kitchen. The reason this was done was that at the future meetings to be held in the glamour kitchen at which various women's groups would be present the Home Service bureau supervisors of the gas company could tell the women where these appliances were sold. The dealers were highly enthused about this plan—a way of getting their merchandise before all the women of the community without cost.

When the Hospitality room was ready special invitations were sent to the most prominent women and club leaders to attend the grand opening. They were to be the guests of honor, as well as the dealers and their wives.

At this first meeting the utility arranged with the staff in its Home Service bureau to dramatize their cooking presentations through a play called "The Bride Saves the Business". A play about a young bride who was using an obsolete cooking stove while she was preparing a special meal to be served to her husband's guest—a big business man with whom he was negotiating a big deal. Her stove acted up and about ruined her dinner until a next door neighbor with a model kitchen (the one on the stage in the hospitality room) was used. Everything turned out fine and the big business man was sold and the bride saved the business.

The total time for the presentation of this play was 40 minutes. During



this time a cake is baked, a rib roast of beef prepared, two kinds of fresh vegetables, and a salad.

The play idea, while not original as a method of presenting merchandise, was original in the community it was first presented in. The first meeting was a decided success. The women were told that at any time they wished they could use this Hospitality room for meetings of their clubs or organizations free of charge and could use the gas appliances to help them in the preparation of their food. Mention was made where the appliances could be purchased for their homes.

The success of the plan was so good at the Forest Grove premiere that now three Hospitality rooms are in yearlong use at Portland, Forest Grove and Vancouver. A fourth is being planned for Salem, Oregon, the capital of the state of Oregon. That women like this plan is evidenced by the Vancouver Hospitality room. Vancouver has a population of about 20,000 persons. The few months the glamour kitchen has been in operation nearly 3000 women have attended and made use of the offer for them to hold their meetings and gatherings there.

1:—The Portland, Ore. glamour kitchen. As many as 2000 women have attended meetings during a single week.

2:—Close-up of a CP range with mirror placed so that audience gets a bird's eye view of the range top and cooking operations. Rita Calhoun carves the standing rib roast.

3:—Another close-up of the CP range with angled mirror above.

4:—Hospitality Room Kitchen at Vancouver, Wash. office. Rita Calhoun, center; Marian Dunn on the right.

The play is not given all the time, of course, but some member of the Home Service bureau is always on hand to help and to remind women about the efficiency of gas appliances. In the Vancouver area, where there are lots of mills, mostly lumber and plywood ones, and where wood and electricity have been the methods used for cooking, gas appliance dealers report nearly an 8% increase in the sale of appliances. The utility records show a 7% increase in customers. The majority of this success is directly attributed to the idea behind the Hospitality room: a way to interest women and some place where women can be brought together to see how efficiently gas appliances will best serve them. Denoting again that seeing is selling.

The gas appliance dealers are given excellent cooperation by the utility. In turn, each gas appliance dealer is allowed the opportunity to have the appliances he sells installed in these glamour kitchens, and always during the cooking demonstrations or lectures—never longer than 20 minutes, unless the play is given—the Home Service bureau experts mention the models of gas appliances being used. Many dealers report as much as nearly half their sales coming directly from this method of presentation.

When a group meets at one of these Hospitality rooms for the first time there is always a door prize or perhaps several door prizes. The gas company sends every woman a ticket which admits the holder to the playlet. (See illustration.) The holder writes her name on the main part of the ticket and also on the stub which is torn off. Stubs are put into a "hat" and when the drawing occurs, the woman's name drawn gets a prize: sometimes it's the meal that has been cooked and which is taken home by her to feed her husband, or it may be dishes or pots or pans.

In the process of developing the glamour kitchens it was discovered

Six miles a minute

...with confidence!

THE SECRET ? CONTROL

A roaring monster hurtles over the Bonneville salt flats, faster than man has ever travelled on wheels. A new record established, the driver climbs out casually—a carefully-built *control* mechanism gave him confidence that he would emerge with a whole skin.

The gas industry, too, has found confidence in the Harper Burner System, whose *efficient control* has revolutionized top-burner cooking By giving greater flexibility and accuracy to heat *control*, it is daily selling more women on the advantages of *gas* cooking... has become standard equipment on better gas ranges.

pr. 1940, Harper-Wyman Co.

CONTROL *is the secret here, too*

● The Harper Burner System is a patented invention whereby each of the burners on the range is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle.

This arrangement affords a high-speed STARTING BURNER to *start* foods boiling and for fast frying... plus a small, central, economical COOKING BURNER for *maintaining* the cooking. The COOKING BURNER can be used entirely independently of the STARTING BURNER. No other top burner possesses this vital advantage — which insures easy, accurate control: just the right heat for every type of top-burner cooking... every time.

HARPER-WYMAN COMPANY
8562 Vincennes Avenue, Chicago, Ill.

HARPER BURNER SYSTEM

HARPER BURNER SYSTEM

Demonstrates GAS at its best

SEE OTHER SIDE OF THIS PAGE

"HOW DO YOU KEEP YOUR DRAPES LOOKING SO FRESH AND CLEAN?"

"THE HARPER BURNER SYSTEM ON MY RANGE HELPS A LOT"

FACT:

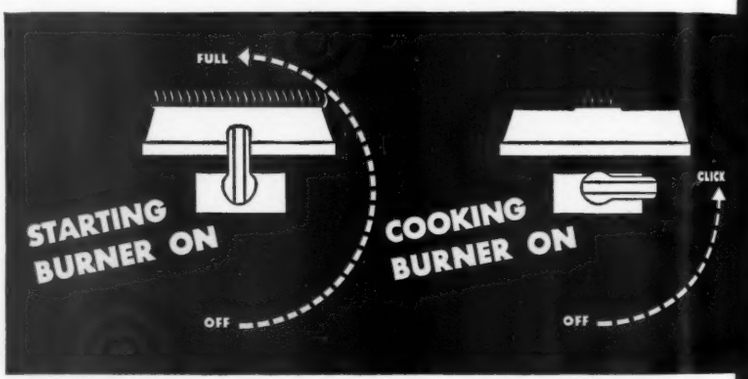
Odors and dirt caused by cooking vapors are less of a problem in homes where the range is equipped with the Harper Burner System.

REASON:

The Harper COOKING BURNER is adjustable to *lower heat levels* than ordinary top burners—is accurately proportioned to keep the contents of a covered vessel just at the boiling point. Thus, less steam, laden with clinging odors and tiny grease particles, is created to be carried into every room.

BENEFITS:

Walls, window screens, curtains and drapes are easier to keep clean. Cleaning bills are reduced. Cooking odors do not permeate the furnishings throughout the house, causing an unpleasant, "stale" atmosphere.



The Harper Burner System provides a burner within a burner. The diagram above shows how the COOKING BURNER operates entirely independently of the STARTING BURNER. Yet both are controlled by the same handle.

We shall be glad to send you, without cost, two booklets that tell the complete Harper Burner System story . . . "Modern Methods of Top Burner Cooking" and "The Greatest Cooking Discovery in 40 Years". They should be valuable to anyone interested in the promotion of gas cooking and gas appliances. *Harper-Wyman Company, 8562 Vincennes Avenue, Chicago.*

SEE OTHER SIDE OF THIS PAGE

HARPER BURNER SYSTEM

HARPER · BURNER SYSTEM ·

that sometimes women in the audience couldn't see how things were being cooked. That difficulty was overcome by the installation of angled mirrors directly over the C/P gas ranges. The mirrors so arranged allowed any woman in the audience to see directly into the pots on the stoves and see how foods were being cooked. (See illustration.) This one thing jumped women's interest from being general to intense concentration upon the presentation. Any smart merchandiser knows the value of women concentrating intensely upon a piece of merchandise. The answer nearly always equals just one thing—a sale.

Rita Calhoun, Home Service supervisor for the gas company, in reporting her experience on this type of gas appliance sales promotion says, "First, it impressed gas appliance dealers tremendously because of the many sales it made for their appliances as a direct result of women's groups attending Hospitality rooms. It also made dealers highly enthusiastic about the appliances they had to sell. They attended these presentations and learned many valuable sales talks about appliances which they used to induce women to buy their merchandise."

It was also found that women learned the gas appliance sales story much better because the story or play allowed ample room to get gas appliance sales points across to them. Women's study groups have requested many times to have the performance given exclusively before their groups. But the greatest point of all was that a greater number of sales resulted from this type of demonstration.

Some facts about the yearlong Hospitality Rooms as outlined by Webster Jones, public relations counsel for the utility, include the startling information that as many as 2000 women have been in the Portland glamor kitchen and that was in a week's time. Of this number direct sales of ranges have totaled ten in a day. Men's clubs, too, have used the glamour kitchen as a meeting place. Food has been prepared while they had their meetings and after eating a gas-cooked dinner, many sales have resulted by men buying a new range for their wives as a surprise.

Women's groups, clubs, society organizations are sent invitations by the utility to come and use the Hospitality Rooms any time they wish. This method has built a waiting list many times. The only regulation the utility insists upon is that groups may not hold their regular meetings all the time in the rooms, but any time they desire to attend for a special meeting they are welcome to use it according to available dates.

When the Home Service bureau staff is talking to the women, the word housewife or housewives is never used. Instead they are called house managers, a name which women like and have adopted in this area in referring to their occupation when asked.

And here is the story of how to sell gas appliances in communities where wood, coal or electricity offer big competition to gas appliances. A sure fire way to build sales, all because gas appliance dealers wanted something to be done about the problem and because R. G. Barnett and John J. Winn, Jr., promised that something would be done.

THE REPUBLIC HUMIDIFIER
for HARD WATER AREAS

A self-cleaning model is now available.

Lime concentrates automatically discharged from evaporator at frequent intervals.

Every gas utility can now add this new and profitable load.

AUTOGAS COMPANY

2258 DIVERSEY **CHICAGO, ILL.** 8" x 15" x 25"

Vancouver B. C. Utility and Many Dealers in Cooperative Sales Drive

GAS SALES have been developed to a new high mark in Vancouver, B. C., during the past two years by an intensive campaign conducted by the British Columbia Electric Railway Company through its gas division. This campaign has been directed towards securing a complete co-operation and support of every retail merchant in the city of Vancouver selling a gas range or other gas appliance. Sanitary engineers, hardware dealers, furniture merchants, department stores, chain stores, and even electrical dealers have all been enlisted in this co-operative drive.

For the current year the company set as its quota the total of 1559 ranges. It was estimated that of this amount, the company would sell 765 ranges in Vancouver, New Westminster and adjacent points and 160 in Victoria while independent co-operating dealers would sell 600 ranges in Vancouver and 34 in Victoria and district. Before half this period had lapsed, the quota was well in sight and it is now evident that the total sales for 1940 will far exceed expectations of both the company and its co-operating dealers.

The B. C. Electric has been developing the market for gas ranges intensively in Vancouver and Victoria by cooking schools and extensive advertising of various varieties. The company has an advertising plan in connection with its dealer sales relationships whereby the Utility pays the full cost of dealer advertising in cases where credits to the dealer on his sales warrants such expenditure. In other words definite allowances are allocated to the dealers on the basis of ranges and refrigerators sold and the company pays dealers monthly out of this allowance as bills for advertising are submitted.

In addition it has worked out a scale of trade-in allowance of $10 for gas ranges under $100 in value, or $15 for gas ranges under $150 in value and an allowance of $20 where a certain performance range is sold regardless of its value.

Installation allowances are also granted by the B. C. Electric under its dealer co-operation program. These allowances are $11 for ranges under $100 in value and $16 for ranges over $100 in value. Actual installation is being farmed out to plumbing and heating engineers where possible by the B. C. Electric under an agreement developed between the sanitary engineers' organization and the Utility. In order to further develop this business in gas ranges, the B. C. Electric has organized all independent dealers in a gigantic "Round-Up."

Window displays, window banners, special advertising in newspapers, and direct mail matter are all utilized in this highly successful co-operative drive to sell gas ranges. The idea of the typical western cowboy phrase "Round-up" has caught the imagination of hardware dealers, plumbing and heating engineers and furniture dealers and all are co-operating with the B. C. Electric in this special merchandising event. Last year this campaign in six weeks moved 219 ranges.

IT'S OLD RANGE ROUNDUP TIME IN NEW WESTMINSTER
Good Bye old Pal
'Taint yore fault yore a worn out "has been," ready for the glue factory.
And 'taint yore fault your tinny old oven won't hold the heat and you' waste gas.
Never mind ol' pal you were a high stepper in yore day, but things is different now.
It's Old Range Round-Up Time in New Westminster so we're agoin' to trade you in on a slick new gas range . . . such as the new C-P (Certified Performance) . . . it's a real high falutin' jim dandy, with all the new wrinkles . . . automatic lighting . . . oven heat control . . . new improved burners that save you real money . . . swell broilers . . . storage compartments, minute minders, condiment sets . . . self-lighting, etc., etc. . . . and such style . . . they're so good lookin' they'll knock you daid in yore tracks.
Come in and see these smart new gas ranges of 1941 and let us tell you the trade-in value of your present old stove.
HERE'S HOW YOU TRADE 'EM IN: You'll get a $20.00 allowance for your old gas range when you buy a C-P (Certified Performance) gas range. For any new gas range $100 or over you're allowed $15 on your old gas range no matter what condition . . . $10 if the new range is under $100. A generous allowance is made for old coal, oil or sawdust stoves. You get free installation of the new gas range and can arrange easy terms on your regular service account.
Highest prices allowed on ol' broken down Ranges
C-P (certified performance) gas ranges are built in Canada by Moffat and Gurney.
BCElectric STORES
C-P gas ranges are Canada's finest, built to rigid specifications for the greatest efficiency.

One of the newspaper advertisements used in this campaign. Original size 4 col. 15 inches.

In this six week period the normal sales in the past have been around 140 to 150 ranges, but this was stepped up to 219 by the special drive, and this total does not include quite a number of sales closed, or practically closed, but where actual installation had not been made for various reasons within the period.

Range sales total of 219 units was composed of 161 all gas ranges and 58 combination units. Dealers co-operating sold 27 all gas ranges and 45 combination units, while the utility showrooms and sales crews sold 134 all gas ranges and 13 combination units.

The biggest feature was the window contest, and here real originality was shown. The winning window was staged by the Alberta Furniture Co. at their Seymour Street store and stressed the western "Round-up" idea. A corrall effect was created by trees stripped and arranged just inside the plate glass. A figure in cowboy costume with lariat in hand was arranged in the off centre foreground and the floor covered with straw. Old ranges were grouped in the background and a modern gas range and gas combination unit on either side to the front of the display.

Bucking horses, cut-outs of cowboys, desert scenes, and many other novel ideas formed the theme of other windows in which the "Round-Up" theme of the campaign was stressed. Prizes were awarded for the four best windows selected by a committee of three outstanding local display managers. Manufacturers' representatives aided in the drive by going out wtih salesmen to close some of the orders, and the manufacturers donated towards the prize fund. Each salesman drew prizes in ratio to his volume in addition to actual revenues gained by the sales themselves.

This co-operative drive between all branches of the gas range retailing industry and its associate trades was only possible as the result of the policy of the B. C. Electric in consistently developing the co-operation of appliance dealers in the Greater Vancouver area.

CONVINCING PROOF
97 OUT OF EVERY 100 CUSTOMERS
WHO TRIED AUTOMATIC GAS
WATER HEATERS BOUGHT THEM
For the first time in our history, we offered our customers last May the opportunity of actually trying an automatic gas water heater in their homes before buying. The trial period was 60 days. Within the next two and a half months more heaters were installed in Westchester homes than in any similar period in our history. 97 OUT OF EVERY 100 CUSTOMERS WHO TRIED THE AUTOMATIC GAS WATER HEATERS, KEPT THEM.
NO DOWN PAYMENT
Turn in your old pot-stove or other non-automatic water heating equipment for a Liberal Allowance on a brand new automatic gas water heater. This allowance will be your down payment! The balance can be paid on easy terms. Visit our office nearest you—see the water heaters on display and ask for full information concerning them.
EASY TERMS
LIBERAL ALLOWANCE
AUTOMATIC GAS WATER HEATING MEANS CLEAN HOT WATER INSTANTLY
Automatic gas water heating is ALWAYS dependable. No matter at what hour of the day or night you want it, or the quantity desired, an abundant supply of clean hot water is available at the mere turn of a faucet. No waiting for water to heat—no stair climbing or stove tending.
Yes! The convenience which this service offers is GREAT, but the cost is SMALL.
And, remember, no system offers a way to heat water "for nothing"...not even in winter. The home owner who uses a furnace coil adds a definite expense to his house heating bill.
Listen to "Your Album of Music" on Mondays at 2 P. M., and "Your Program" on Thursdays at 1 P. M., Station WTAS. Dial 1310 or 131.
WESTCHESTER LIGHTING COMPANY

HERE'S A STRONG WATER HEATER AD.

One of several newspaper advertisements used by Westchester Lighting Company in the dailies of Westchester County. This is 1/3 actual size:—original is 6 columns, 17½" high.

New Pipe Line Construction by Memphis Gas Company

Hundreds of workmen are constructing a 90-mile pipe line at a cost of $1,250,000 to assure Mississippi Power and Light Company customers in Northwest Mississippi of an adequate supply of natural gas this fall and winter.

The new pipe line is being built by Memphis Gas Company, which supplies Mississippi Power and Light Company with natural gas for its network of city and town gas distribution systems in that area.

Although the pipe line already in use is sufficient for ordinary needs, it was not sufficient to meet the peak demands of the coldest winter in 40 years (1939). The new line will increase considerably the capacity of the old line of the system and will assure against a possible curtailment in service such as occurred briefly last winter.

The present mains were laid in 1929 with a capacity of 60,000,000 cubic feet a day. The new line will parallel the old and increase total line capacity of the system to more than 85,000,000 cubic feet which officials of Memphis Natural Gas Company and Mississippi Power and Light Company estimate will not only take care of any possible demand but also provide an adequate supply of fuel for the growing industrial needs of the section.

Several compressor stations along the way maintain the pressure of the gas.

Right-of-way crews, with giant "Cats" and bulldozing equipment, clear the route of the 18-inch steel mains. The big tractor-like machines must prepare the way for automatic ditch-digging machinery. To do this, hills must be leveled, low places filled and canals bridged.

As soon as the right-of-way is cleared, trucking crews begin moving in the long spans of heavy pipe, which must be welded into one continuous line by welding crews with portable equipment mounted on trucks.

Before the pipe can be buried in the machine dug trench it is specially treated to protect against erosion and deterioration from within and without. A coating of primer paint, then coat of liquid enamel is applied to the steel surface by means of machines which are mounted on the pipe. A second paint-spraying machine follows and coats the enamel with whitewash to safeguard against the effects of the sun's rays.

The Selling Parade

A Digest of Successful Selling Ideas

By
Charles B. Roth

A YOUNG FRIEND OF MINE, Bill Stubbs by name, about the most ambitious young salesman I ever knew, hit quite by accident upon an idea that made him twice as much money last year as he earned the year before. The idea: *that nothing really interests customers quite so much as themselves and their own possessions.*

Bill was selling an appliance for the home. When he called on his prospects in their office and talked about it, he often got nowhere. It was too impersonal. Then he hit upon the idea of taking pictures of the man's home and using them in his approach. He would toss the picture down on the desk and say: "I called to talk about that home of yours."

The prospect, looking at the picture, immediately became all ears. He was unable to resist the self-interest of the picture.

Using self-interest is a simple but infallible way to increase sales. You can use it in your business. Kenneth M. Goode, my favorite business writer, has collected a few examples of the influence of this interest each of us has in himself.

He found that nothing is so interesting to a person as his own name, except his own picture. Five hundred college women were given a pen and asked to write: 460 wrote their own names. Show a map of the United States and 447 out of 500 persons will look for the location of their own home town. Flash a group picture on a man and he'll pass by everybody else to pick his own picture out of the group.

It's self-interest that raises sales.

THE PRESIDENT OF THE FIRM said he wanted me to wait for a while so that I could meet his most successful salesman. He rang for his secretary and told her to get Rogers off the floor. And presently Rogers appeared; a small man, insignificant in appearance, not a go-getter in looks or manners.

"I have been telling this gentleman," the president said, addressing his salesman, "of your record. He is interested in the philosophy of salesmanship, and I thought maybe he'd

like to ask you a few questions about your methods."

"I'd like nothing better," I declared. And because Rogers was not averse to answering them, I had a most amazing fifteen-minute talk with a man who has discovered one of the major secrets of selling.

Rogers is so successful because he does not consider his sales interviews to be sales interviews at all!

He looks upon them as consultations.

"I abhor the idea of selling that it's a battle of wits," said he, "with the salesman trying to get the better of the customer, with the customer trying to get the better of the salesman. Early in my career I assumed that my primary job was to help the customer get more for his money. If I succeeded in that, I thought, I would succeed in selling.

"My father was a doctor, a noted and a successful man. He often had consultations with his patients—long, intelligent and friendly discourses on what would best help the patient to get well. He once told me that he took his patients into partnership with him, and that they talked things over as two congenial partners would.

"Well, that's my idea of a selling job. I become a partner of every customer. We hold a consultation together, to decide what will help him most, how he can get the most for his money. I guess I haven't anything more to tell you about my methods. I haven't any methods, really: I have only one method. You know now what it is."

And I was forced to tell Rogers that I consider it to be, not *a* method, but *the* method for making more sales—the ideal method.

THE LATE JULIUS ROSENWALD, one of America's greatest merchant princes, often told his associates that one of the reasons for his success was that he tried to take the buyer's position in the matter, rather than the selfish attitude of the seller.

This paid him handsomely, said he.

Even when his firm had become a vast national organization, Mr. Rosenwald insisted on spending a little time each week behind the counters, selling merchandise to actual customers.

"I try to feel that I am always selling merchandise to myself," said he. "I stand on both sides of the counter."

Any other course for a salesman or a business man is fatal. The fact is that the closer you can come to perceiving, recognizing and then filling the wishes of your customers, the more sales you will make, the more money you will make. I suppose you remember the size of Julius Rosenwald's estate, don't you?

ONCE I HAD A SALESMAN working for me who had everything a salesman needed to make an outstanding success except one thing: good manners. He hadn't the slightest conception of the principles that govern the pleasant and respectable intercourse between men in business, and as a result he got himself in bad, got the firm in bad, got me in bad. In the end I had to let him go: I did this reluctantly; he was a good man. But he had no business in selling which demands a strict code of manners and ethics between customer and salesman.

This man, for example, had a very annoying habit. He would read the letters on his prospect's desk, craning his long neck so as to see them better. This burned the prospects up.

They insulted him, sent him away. He was also a man with considerable nerve. He would barge in where the proverbial angels would have feared to tip toe, and no amount of beating seemed to get any sense into his head. He was self-assured, which is good, but he was also loud-mouthed, which is bad.

I find among the salesmen who call upon me that a far too large a percentage of them are ill-mannered. I dislike to make this charge. It is serious. But you can't ignore a fact.

Just the other day a young salesman came in to see me. He noticed an unusual paper weight I have on my desk. He picked it up and examined it, and I resented that. On thinking it over, it seems to me he did not do anything very grave to offend my code of manners, but what he did was grave enough to cause me to buy elsewhere.

In such a case as I have just described, what he should have done was to remark about the unusual paper weight, commend it and ask

my permission to examine it. This I would have granted readily.

Good manners without affectation never offend anyone, but you can never tell when lack of good manners will be offensive—and drive away a sale. It pays to use the best manners all the time.

MY FRIEND CARTER is easy to get along with and his salesmen all like him. He very seldom "blows up." But one day last week he did, and I was in his office when it happened.

He called in the salesman who had offended him, and what he didn't tell that boy wasn't included in the catalogue of invective. I think the salesman needed it and that it will do him good.

His offense?

He merely wrote on his report sheet that he had made some "routine calls."

"Routine calls?" Carter snapped. "There is no such thing. If selling lapses into routine, it becomes very poor selling, routine selling, non-selling.

"You fellows have got to cut routine calls out of your selling life and vocabulary," said he. "What do you mean by routine calls? Visits? That must be it. You drop in, say hello, pass the time of day, talk baseball, get out. Is that it? And you call that a sales call!

"Listen: Have something to say and something to sell every time you call on a customer, and do your darndest to get an order. If you are in the habit of making routine calls, you get into the habit of failing. And once you get the failing habit there is little hope for you!"

A book for Every Gas Salesman

HOUSEHOLD GAS WATER HEATING

By Charles W. Merriam, Jr.

Nine chapters of the true essence of this subject.

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Gas Consumption for Water Heating
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"A Book like this has long been needed to enable our salesmen to present a sound and convincing attack on this most worthwhile business of our industry."—A. M. Beebee, Gen. Supt. Gas Dept., Rochester G & E Co., Rochester, N. Y.

"A Real contribution to the gas industry."—R. A. Koehler, Chairman, A.G.A. Water Heating Committee.

Size 5" x 8", 142 Pages amply illustrated. Cloth Bound. Special Close-Out Price $1.00 a Copy.

AMERICAN GAS JOURNAL
53 Park Place New York

TITAN WATER HEATER CONTROLS

AGA Approved TITAN Temperature and Pressure Relief Valve

This device is installed on the hot water outlet in the tank directly in the flow of water. Action, as a result, is unfailing and positive, there being no dead pockets to prevent proper functioning of relief valve.

Pressure relief is obtained through a spring-loaded valve which opens when the pressure reaches a predetermined point. Should the water become overheated to 200° F, a fusible disc melts and lets the water escape thereby preventing a further increase in temperature.

The Titan Relief Valve serves as a coupling connected in the line thereby eliminating the necessity and expense of a tee fitting. To replace fusible disc, it is not necessary to disassemble valves or piping in any way.

Design for application to storage or range boilers. Prevents corrosion, scalding and explosion.

Catalog and full information upon request.

The Titan Valve & Manufacturing Company

Thermostats • Safety Pilots • Relief Valves • Safetystats
9913 Elk Avenue Cleveland, Ohio

Philadelphia Electric Company Prepares to Meet Increased Demand for Gas

Noting an increase in sales of gas for industrial purposes in the Philadelphia area, Henry B. Bryans, executive vice-president of the Philadelphia Electric Company, recently (October 29, 1940) told an engineering and operating group that the gas department of the company was fully prepared to meet all requirements of industry in the Philadelphia area arising out of national defense preparations. He reviewed developments of the year in the company's gas plants as they contribute to present-day preparedness for any increased send-out necessary.

"Many local industrial plants participating in the defense program are large users of gas," Mr. Bryans said. "Sales of gas for industrial purposes are 46 per cent greater than last year. As payrolls expand, an increase in residential sales may also be expected.

"As part of the Philadelphia Electric Company's contribution to national defense, the Gas Department must keep abreast of the increased requirements for service, not only by the installation of new equipment, but by getting every possible cubic foot of capacity out of existing equipment.

"The reformed oil gas plant at Chester is a very important unit of the Philadelphia Electric Company system, producing about two-thirds of all the gas sent out. Improvements to existing equipment, and in methods of operation have increased the generating capacity of this plant from 25,000 MCF to 28,500 MCF per day, or 14 per cent. The ultimate capacity of the existing generators at Tilghman Street is now estimated at 30,000 MCF to 35,000 MCF per day.

"The increased capacity was obtained as follows:

"1. By increasing the specific gravity of the gas produced from .63 to .68. This change has no detrimental effect on the operation of appliances, and increases set capacity by about 12 per cent. The increase in gravity was made possible by connections installed at West Conshohocken plant to permit control of the gravity sent out from that plant to the Main Line Division. Formerly, whenever West Conshohocken gas was supplied to the Main Line Division, the reduction in gravity caused unsatisfactory appliance operation, and placed an upper limit on the Chester gravity. This upper limit was removed when the gravity control connections were installed.

"2. By the installation of additional scrubbing equipment to clean and cool the gas immediately as it leaves the reformed gas set. The additional cooling reduces the volume to be handled through the plant mains about 40 per cent, and the removal of tar and carbon particles prevents the accumulation of these materials in the mains, which formerly resulted in back pressure and loss of set capacity.

"3. Another factor in the stepping up of capacity has been a rearrangement of checker brick in the carburetter and superheater. The original arrangement, while very efficient for water gas operation, was not suited to the production of reformed oil gas. Rearranging the checkers reduced pressure loss through the set and permitted a higher air rate during the blow and blow run. This results in more time during each cycle for gas making, and greater capacity.

"4. Another development made during the current year was a new operating cycle. This change reduced the coke used per MCF of gas, about 30 per cent, and contributes to higher capacity by reducing the time required for charging and fire cleaning.

"5. In order that the oil gas flow to the sets may keep pace with the increased rates of production, the oil gas pressure is being stepped up. This change will also improve the control of the rate of flow of oil gas during the reforming portion of the cycle.

"While all of the above changes are not complete, results of the program are already evident. Heretofore, due to back pressure and other difficulties, it has never been possible to obtain as much capacity per set when three sets were in operation, as could be obtained with one set operating alone. On October 22, however, three sets produced a total 1200 MCF per hour, or three times the capacity of one set.

"It is necessary to provide adequate means of sending out these greater quantities of gas. To this end, a booster-compressor is being installed at Upper Darby, which will have the effect of increasing the capacity of the major Chester-Upper Darby transmission main by 20 per cent and will make it unnecessary to carry excessive pumping pressure at Chester.

"In view of the important part which gas applications play in industrial processing, there can be no doubt that the picture I have briefly presented of our gas activities shows that in this department we are well prepared to face what the future may bring forth.

"It takes good men and good equipment to make a great utility organization. We have both. That is why in this period when the nation is taking stock of all its resources we can look any questioner straight in the face when he asks: "Is the Philadelphia Electric Company prepared?" **The answer is yes.**

1941 Conferences on Industrial and Commercial Sales

The A.G.A. Conference on Industrial Gas Sales will be held on March 13 and 14, 1941, at the Lord Baltimore Hotel, Baltimore, Md. The A.G.A. Hotel, Restaurant and Commercial Sales Conference is scheduled for April 24 and 25, 1941 at the Palmer House, Chicago.

Each of these popular conferences is customarily attended by several hundred non-residential gas men and executives supervising industrial and commercial sales activity, and draws from all parts of the United States. Because of the unusual current expansion of business, both in industry and in hotel and restaurant fields, exceptional interest and attendance at both of the 1941 meetings is expected.

This is the first time that the A.G.A. Industrial Sales Conference has been scheduled on the Atlantic Seaboard.

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600,000 bu GPM prepared iron oxide sponge at your service by water, rail or truck.

GPM IRON HYDROXIDE

GAS PURIFYING MATERIALS CO., INC.

Long Island City, N. Y.

Methods and Accounting to Minimize Unemployment Taxes

Committee Report of Subcommittee on Social Security Accounting

W. D. Virtue, Chairman
Public Service Co. of Colorado
Denver, Colo.

THE past several years have seen a constantly increasing tax burden placed on the gas utility industry. These increases have come with such regularity that the inclination is to accept them without comment. Not the least of these new taxes have been occasioned by Federal and State Social Security legislation. Unemployment taxes alone now amount to 3% of the payroll of the gas industry. Since this payroll amounts to well over $200,000,000 annually, it will be realized that the tax thereon runs into a substantial figure.

The possibilities of tax reductions lie in taking advantage of every deduction permitted by the law and of so adjusting operations to secure the benefit of maximum savings under Experience Rating provisions. There can be no criticism of steps taken to minimize taxes as the Supreme Court of the United States has held that the taxpayer has the right to decrease the amount of his tax liability by any method of legal tax saving.

The Federal Unemployment Tax Act (Formerly Title IX) was enacted with the intent that provision should be made during periods of employment for periods of unemployment, thereby providing some income and relieving a considerable amount of distress among unemployed workers.

The Federal Act provided for a graduated tax on employers, which at the present time amounts to 3% of the taxable payroll. If the individual state enacted a statute providing for unemployment compensation which met certain Federal requirements, the employer was allowed a credit on his Federal tax of the amount paid to the State up to 90% of the amount due under the Federal law. Since the payments by the employer were the same in either case, providing the state levy was not greater than 2.7%, each State to all intents and purposes was forced to enact such legislation in order to obtain benefits for their citizens.

Subsequent to the passage of the Federal Act, each State enacted statutes providing for benefits to unemployed workers who were able to qualify under the prescribed conditions. Under the laws of some states the employer of a single employee may be subject to the act while in no case do the state statutes exceed the provision of the Federal Act providing for a tax on employers of 8 or more. Each state was confronted with the problem of providing a vehicle for unemployment benefit payments, since the Federal Law makes no such provision.

Most of the states in their Unemployment Compensation Laws provide for Experience Rating benefits to the contributing employer. These provisions were conceived with the purpose of promoting stable or continuous employment through the incentive of lowering the tax rate. Companies showing the most stable employment receive the lower rates. Most companies can without question improve their employment situation by a careful analysis of operations. This is borne out by the results obtained by employers in states which have Experience Rating provisions.

It is impossible to prescribe a uniform method for Unemployment Tax accounting due to differences in the state laws. There are, however, many points in common and it is to these that attention is directed. The basic question involved is:

How can the amount of tax be held to a minimum?

Where the Experience Rating benefits are obtainable, it becomes the major factor in establishing the tax rate and, therefore, the amount of the tax. Experience Rating is determined by the relationship of the taxable payroll to the amount of Reserve accumulated in the employer's account with the state. One important factor in maintaining this reserve arises from charges against it resulting from former employees' applications for benefits. The accuracy with which these charges are made affects directly the ratio of the taxable payroll to the Reserve Account balance.

Where the Experience Rating benefits are not obtainable, the amount of tax can only be minimized by holding the taxable payroll at a minimum.

For the purpose of this discussion, both conditions are covered under the two divisions:

1. Minimizing the taxable payroll.
2. Minimizing charges to the Reserve Account.

Minimizing Taxable Payroll

The Federal Act, which is the basis for most of the State Acts, defines "taxable wages" as follows:

Section 1426 (a) of THE ACT

WAGES

The term "wages" means all remuneration for employment, including the cash value of all remuneration paid in any medium other than cash; except that such term shall not include:

(1) That part of the remuneration which, after remuneration equal to $3,000 has been paid to an individual by an employer with respect to employment during any calendar year, is paid to such individual by such employer with respect to employment during such calendar year;

(2) The amount of any payment made to, or on behalf of, an employee under a plan or system established by an employer which makes provision for his employees generally, or for a class or classes of his employees (including any amount paid by an employer for insurance or annuities, or into a fund, to provide for any such payment), on account of (A) retirement, or (B) sickness or accident disability, or (C) medical and hospitalization expenses in connection with sickness or accident disability. * * * *

(3) * * * *

Presented at the Annual Convention, American Gas Assn., Atlantic City, N. J., October 7-10, 1940.

(4) Dismissal payments which the employer is not legally required to make.

The intent of the law is that taxable wages should include all payments for services with a limit in most states of $3,000 per year. The amount in excess of $3,000 should be eliminated from consideration as a part of the tax base. This limitation applies in many states although not in all. However, in certain other states, the administrative office has suggested that no payments be remitted of amounts accrued on wages in excess of $3,000 per year looking forward to a revision in the law at the next meeting of the state legislatures, most of which meet in 1941. In these instances the state law would then conform to the Federal law.

Retirement

In many companies payments are made to superannuated employees where little or no services are required of them even though no formal pension plan is maintained. These payments may represent a proportion of their past earnings, the amount required for living expenses, or be determined on some other basis. It is generally held that payments made under these conditions are not subject to Unemployment Tax. In the event that such employees are recalled for active duty, the payment made during this period for services rendered are taxable.

The question has arisen, however, as to whether or not, if they are subject to call, all of the wages paid would be considered taxable predicated on what might be called a readiness-to-serve charge. The records should be clear that employees of this nature are not expected to perform further service for the company. If they are so carried, there is little doubt that all payments of this nature may be excluded from taxable wages.

Sick Pay

Payments of monies for absence from work due to personal illness or disability may also be excluded provided the company operates under a definite plan or system applying to all employees or classes of employees. As to just what constitutes a "plan" is a moot question. It appears that the "plan" may be unwritten so long as it is generally known to employees and all employees of a class or classes are treated on a similar basis. It is suggested that wherever possible the plan be reduced to writing and the covered employees advised of its provisions.

Dismissal Payments

Dismissal payments may be defined as follows: "Any payments made by an employer to an employee on account of dismissal, that is, involuntary separation from the service of the employer, are excluded from 'wages,' provided the employer is not legally bound by contract, statute, or otherwise, to make such payments."

Where it is the practice of the operating company to pay in advance of the time worked at the time of dismissal, these payments may be excluded from taxable wages if such payments come within the concept of "Dismissal Payments" as defined heretofore.

Use of Personal Automobile

In many instances employees are required to use a car in their work and the possession and use of the car is a condition of employment. Wherever possible, the payments made to the employee representing a reimbursement for the expense of operating his car should be separated from his regular compensation. Payments for use of the car under these circumstances would not be payment for services and therefore not be considered as taxable wages. In order to justify the elimination of this payment from compensation earned, information should be available indicating the basis for reimbursement of car expense incurred. Examples of the above type of car expense occur in many companies in the meter reading, collection and sales departments.

Continuous Employment

The problem of providing continuous employment is one which is receiving, and should receive the serious study of the gas industry. Basically, providing continuous employment is the result of laying out proper working schedules and of the proper selection of employees. The laying out of working schedules applies to both construction and maintenance activities. It has been common practice in the past to do most of the construction work during certain periods when the weather is most favorable for this work. In the future, it appears that every effort must be directed toward doing a substantial amount of construction work, if possible, during other periods. Construction costs may be slightly higher under these conditions, but the increase in construction costs probably would still be substantially less than the additional bonus of approximately one-third that might be paid in the form of Unemployment Benefits as a result of peaks in construction work. A somewhat similar situation prevails in the handling of a great deal of special work—such as extraordinary maintenance, transferring of meter slips, special customers surveys, preparation of statistical data, etc. It will be found on analysis that a great deal of this type work can be anticipated and spread over considerably longer periods which will result in a more uniform number of employees over the correspondingly longer period of time. Otherwise, the hiring of new employees for short periods may tend to increase the rate of tax in the following year if the state is operating under an Experience Rating Plan.

Temporary Work

Temporary work should be discouraged wherever possible inasmuch as it potentially increases the amount of benefits charged against the Unemployment Reserve account. The proper supervision of personnel activities would eliminate "laying off" in one department and "hiring" in another doing similar work and would reduce labor turnover.

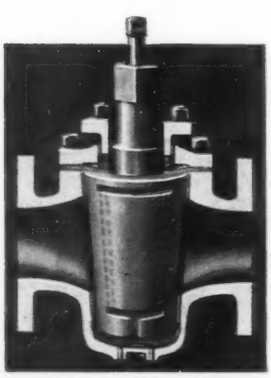
Overtime

Overtime work likewise should be discouraged and full-time employees used whenever the amount of work justifies. It is recognized that on many types of work—such as installing services and appliances, short periods are required to complete the work and therefore overtime is economical. If it is possible to use full-time employees, the amount of contribution for Unemployment Taxes would be substantially less inasmuch as overtime work must be paid for at a higher rate of compensation.

Selection of Personnel

Many of the problems of providing continuous employment are answered through the proper selection of employees. All prospective employees should be viewed with the thought that they will likely become permanent employees and only those who measure up to the highest standards should be employed. Every prospect should have a thorough physical examination in order to detect any defects which may later show that he is not a desirable em-

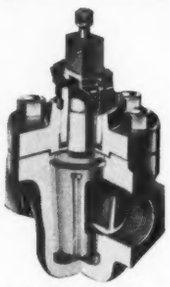
...it can't be done! Stand an egg on end? *Preposterous!* But Columbus was unperturbed. He deftly brought the egg down on the table, cracking it slightly at the bottom. The skeptics were amazed, for *there it stood.* ¶ Instinctively, it seems, Nordstrom Valve engineers have the knack of doing the *impossible.* Miracle valve accomplishments have been attained again and again as a result of Nordstrom ingenuity and initiative. *For instance:* Nordstrom pioneered the first successful lubricated plug valve. Nordstrom has built the largest plug valves, (30″). Nordstrom has developed the only types of valves with lubricants capable of operating at temperatures of 950° F. Nordstrom brought forth Hypreseal, the only plug valve that can take test pressures up to 15,000 lbs. per square inch. Nordstrom introduced new brittle-resistant alloys for temperatures of -150°. And again Nordstrom has cast precedent aside by *Merchroming* valve plugs and bodies with a continuous hard-facing for use in high temperature service and for corrosive and erosive conditions. The "toughest jobs" eventually come to Nordstrom; proof enough these valves meet *all* your needs.



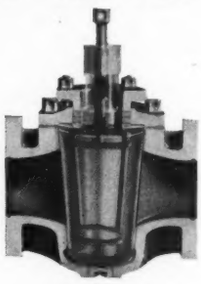
When it can't be done* NORDSTROM *does it!

KEEP UPKEEP DOWN

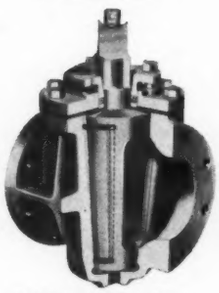
with these ALL-PURPOSE VALVES



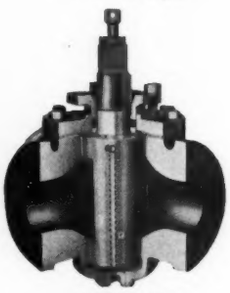
Screwed Gland Type
4" and Smaller



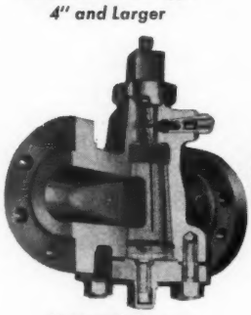
Bolted Gland Type
4" and Larger



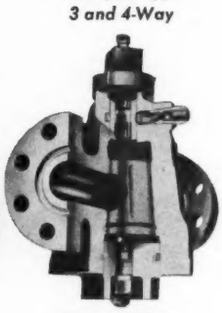
EMCO-Nordstrom Type
4" and Larger



Multiport Type
3 and 4-Way



Hypreseal Type
Flanged Bottom
Rectangular Opening



Hypreseal Type
Screwed Bottom
Round Opening

Descriptive Bulletin upon request.

DYNAMIC PERFECTION IN NORDSTROMS

All valves embody a dynamic principle. But dynamic *perfection* is a rare achievement. Its accomplishment in Nordstrom Valves marks one of the milestones in engineering progress. Comprised essentially of a plug and body, Nordstroms utilize the simplest dynamic principle—that of turning a movable member within a sealed chamber. Nordstroms present the perfect application of the principle. With "Sealdport" lubrication and numerous other engineering advancements, Nordstorm Valves offer a cut-off control which is positive and as complete as though the line was sealed with a welded blank or blind. Incidentally, the practice of using blanks or blinds in connection with valves is totally unnecessary where Nordstroms are installed. The diversified use of Nordstroms on gas, oil, mud and chemical lines with working pressures, in some instances, running to 7500 lbs. and temperatures up to 950° F., is indicative of their perfection.

Nordstrom LUBRICATED VALVES

Sealdport Lubrication

MERCO NORDSTROM VALVE COMPANY—*a Subsidiary of* Pittsburgh Equitable Meter Company

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ployee. Even minor defects should be considered seriously as to their possibility of making the prospect unfit for service at a later date and also to be certain that they do not impair present efficiency.

It is also desirable to require certain standards of education for many types of positions. Probably no one employed in a clerical capacity should have less than the equivalent of a high school education. The maintaining of high standards should provide a high grade of employee and, in the event it develops that there is no longer work available, the employee in question would be desired by other employers. This would eliminate or reduce charges made against the company reserve account since it is just as much to the advantage of the individual company to have former employees employed by others as it is to keep them in the company employ.

The hiring and training of new employees is admittedly expensive and where work can be laid out in such a manner as to provide continuous employment, the expense of this "breaking in" period will be materially decreased and in addition costs covering medical and entrance examinations would be eliminated. In every possible case, the employee should be taught more than one job so that when work is slack in one department, a transfer may be made to another department, which would also add a desirable flexibility to operations.

Independent Contractors

In many cases work may be done by an "independent contractor," particularly for short periods of time and for non-recurring items, and the company is not directly subject to the tax. In certain states, the Act provides that where work is done for a registered employer by an unregistered employer, the employees of the unregistered employer or independent contractor are construed to be employees of the registered employer, and the independent contractor is liable for the tax on wages paid. This very materially complicates the handling of the payments to the State. In an instance of this nature, the unregistered employer must furnish the pertinent information as to time worked, name, social security number and amount earned, to the registered employer as the basis for the contribution, which amount may or may not (according to the laws of the state) be deducted from payments of invoices made to the unregistered employer. If this situation prevails, no payments of invoices should be made until the necessary information is furnished as the basis for a deduction from the invoice of the amount of tax and as identification of the individual employees for the state record.

Vacations

It is the practice of most utility companies to give all employees a regular vacation with full pay. In many instances this has necessitated the hiring of temporary employees during the vacation season and eliminating them from the payroll after the vacation period. Under the present laws, this may result in a substantial penalty in the form of excessive demands against the Company's Reserve account with the state during a following unemployment period. Consideration should be given by all companies to extending the vacation period over a maximum number of months in order that vacation relief may be furnished from regular employees instead of hiring those from the outside on a temporary basis. Vacations are given in consideration for past services in the eyes of the Act and are therefore taxable.

Minimizing Charges to Reserve Account

The second important factor in meeting the Experience Rating provisions has to do with the reduction of charges by the state against the Reserve account.

Separation Notice

Most of the states have a form of Separation Notice which is the means of transmitting the information to the State, showing the circumstances surrounding the elimination of the employee from the operating company's payroll. Extreme care should be used in furnishing this information. Attention is directed particularly to the necessity of indicating the last date worked as this determines when the normal waiting period begins. Payments made past the dismissal date may be in addition to unemployment benefits.

While there is a wide variation in the penalties imposed in certain states, reasons for being out of employment—such as voluntary resignation, discharge for misconduct, refusal of satisfactory work, etc., practically all will disqualify the employee for benefits or set up a substantial waiting penalty period. The information included on the Separation Notice should be complete and a file should be maintained by the company of each case of this kind. This file should be maintained as long as a potential claim is possible in order to contest unjust claims made against the company Reserve account. If a written resignation is received, setting out in detail the reasons for leaving employment, it should be retained. It is doubtful if a written statement can be required and reference is made to Social Security Board release of January 25, 1937 where it is ruled wage earners shall not be required to sign severance reports.

Inasmuch as most states adv se the employer before charges are made against the Reserve account, if Separation Notices are filed within the prescribed time limits there is ample time to check the records from every angle and enter protest where the circumstances justify the same. A misstatement in making application for compensation benefits will disqualify the applicant permanently in many states. If the state administrative officer is advised that the former position or other suitable work is available to a former employee, such employee will be excluded from benefits if he refuses to accept the work offered.

Rehire Former Employees

In case it is necessary to employ persons on a temporary or other basis, it is desirable wherever possible to rehire former employees who may be out of work inasmuch as this will immediately eliminate them from receiving benefits, and also the employer obtains an experienced employee. Generally the offer of suitable work, even though not always accepted, will result in discontinuing charges against the employer's Reserve account.

Check Benefits Paid

States with Experience Rating generally provide employers with a list showing employee's name, social security number and other pertinent information. Every employer should check carefully the amount of the benefit payments paid and charged to their Reserve Account. This should be checked both as to the amount of the weekly and aggregate benefits to be certain that it is in accordance with the pay received while employed by the company, and to be certain that the individual is entitled to receive any benefits.

Wages Paid and Wages Payable

Some confusion has resulted from the interpretation placed on the regulations of the Federal Government as

to "Wages Paid" and "Wages Payable." In the case of the Federal Act, and in some state laws, the tax applies to wages actually or constructively received by the employee. Section 402.303 of Regulations 106 provides—

"To constitute receipt in such a case the wages must be credited or set apart to the employee without any substantial limitation or restriction as to the time or manner of payment or condition upon which payment is to be made, and must be available to him so that they may be drawn at any time, and their receipt brought within his own control and disposition."

Many employers pay employees by check—as for instance, on the 5th and 20th of the month for the preceding calendar half month. This five day delay is occasioned due to the time necessary to perform the clerical and accounting work. The Federal Government has ruled in an instance of this nature that where the accounts of the individual employees are credited at the end of the month and the liability as reflected on the general records is a summation of the credits due each individual employee; and where the employees of the company have the unrestricted right to draw wages earned immediately at the termination of such period without waiting for the normal period necessary to complete the entire payroll; and where such payments are commonly and frequently made; and where cash is available in the bank for the payment of the wage accounts; and where the company's books reflect the amount due and the credit therefor to each employee; that such condition shall constitute constructive payment. Under this set of conditions, the "Wages Payable" would be construed as wages paid for the basis of contribution of Unemployment Taxes.

The foregoing makes it possible for wages earned during a given calendar period to be used for the earnings record for both Social Security and Income Tax purposes.

Records

The entire problem should be approached with the thought that in the final analysis each company is required to keep an adequate record of the basis of compensation and the basis for contribution.

Many of the record requirements have been covered in the preceding discussion. It is particularly desirable that the timekeeper be informed as to the necessity of keeping an accurate record of time off during personal illness. The time cards should be clearly marked in this regard.

The employee's earnings record should show clearly the last day on which services were performed regardless of the fact that payment may be made to a date subsequent to the last day worked. Information should be clear as to the reason for the employee leaving company employment. This is particularly true whether the employee quits voluntarily or is discharged for cause.

Unless there is some limitation imposed by the state, it will generally be found helpful if at the time the employee leaves his employment a notation be made on his earnings record showing the weekly and aggregate benefit amounts. This will materially facilitate the checking of reports made by the state and will insure that payments are not made by the state in excess of amounts due.

* * * *

It was thought at the time Experience Rating provisions were established that such provisions would act to stabilize employment by offering a premium to those employers who were able to arrange their work schedule so that there would not be a continual addition and elimination of employees from the payroll. This has been partially effective. The goal of course, was to provide a full time job for every worker. Experience has shown, however, that the results have been somewhat contrary to those expected. Actually the tendency toward stabilization has reduced the total number of persons employed during a given period. The use of machines for certain work, brought about in part in an effort to halt rising taxes, has also had its effect in decreasing employment.

These situations have occasioned considerable criticism of Experience Rating provisions in existing laws due to the fact that some industries furnish relatively continuous employment, while others inherently are of a seasonal nature. There is now a concerted move to attempt to equalize the effect of the Experience Rating provisions so that if one industry is successful in building up a reserve, it may be applied to another industry which is relatively unsuccessful. If this were done, it would nullify the advantages to be obtained from the Experience Rating and eliminate the incentive toward continuity of employment as a means of reducing the tax rate. This incentive is already lacking in a number of states due to the present method of distribution of the fund.

The Federal statute requires that the Experience Rating provisions included in the various state laws must be certified by the Federal Administrative Board before they may be used to reduce the total amount of tax payment. While the Federal Board is required to so certify within thirty days after submission where the state law meets the requirements, at the present time only a very few states have received this approval.

Prior to certification the total tax cannot be reduced below 3% since any reduction in the state payment would be reflected in a corresponding increase in the Federal payment. When Experience Rating provisions are approved the amount of tax due the Federal government would continue at 3% of the taxable payroll as this amount is not subject to reduction.

The comparatively stable employment of the gas industry as a whole practically assures it of benefiting from Experience Rating provisions. While the various state laws provide for minimum rates ranging from zero to .9%, it is conservatively estimated that one-half of present unemployment taxes could be saved. Based on the present payroll of the gas industry this should be in excess of $3,000,000 annually.

The application of Experience Rating, as a method of reducing costs, is economically sound. The item of Unemployment Taxes is as much a part of the cost of a product as the labor and materials which may enter into that product. The cost is borne by the ultimate consumer. There is no reason why the consumer should pay a higher price for one commodity due to the fact that other commodities cannot be produced as economically. In other words, if the production of goods of a seasonal nature necessitates paying higher labor costs, higher unemployment taxes with higher unemployment benefits, there is no reason why this cost should be included in that of another product which is supplied by a stable industry where the cost may be low by comparison. The production and sale of gas service comes within this latter category. If stabilization of employment results in lower costs, these lower costs should be passed on to the consumer and reflected in his purchase price.

Obviously the principal avenue of tax saving lies in the maintenance of an Experience Rating plan. Everyone in the gas utility industry should be diligent in preserving Experience Rating provisions as presently included in most of the State Laws, otherwise stabilization of employment may be leading toward an increase in benefit payments rather than to a decrease in taxes.

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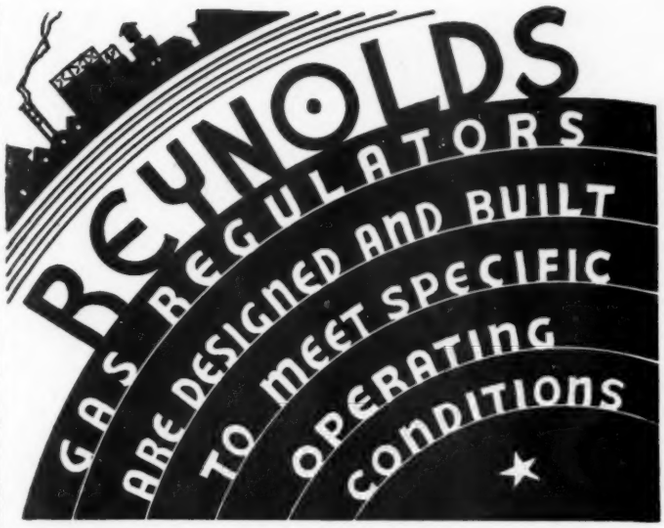

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Commercial Heating Practices

Recommendations Resulting From Survey in New York Metropolitan Area

THE METROPOLITAN House-Heating and Air Conditioning Council has surveyed the commercial heating methods used by the larger gas companies in the New York area. The survey covered methods of computing heat losses, estimating fuel consumption, and installing heating systems. It brought to light considerable variation in the practices of individual companies which were sufficiently diverse to account for the great difference in the characteristics of the various installations.

Commercial heating methods and practices are by no means as well standardized as those of domestic house-heating. Many factors which exert negligible influence in domestic work may completely upset the estimates of a commercial job and give rise to heating complaints for which no apparent cause is evident.

Heat Loss Calculations

The heat loss method of survey is generally used. Although there is some dispute over the values of heat transmission coefficients for certain types of insulated construction, most heat transmission calculations can be accepted as amply accurate for their purposes.

Contrariwise, the estimates of air infiltration are uncertain and are not made in the same way by the different gas companies. For practical reasons, the air change method of estimating infiltration heat losses is used but this is difficult to apply to commercial establishments in which the infiltration due to opening of doors and windows is as great or greater than that entering via the cracks around them.

Therefore, each company has attempted to set up its own general rules for the number of air changes to be applied for a given kind of building or business. No attempt is made to analyze the amount of air entering around a particular window or door. Instead, the number of times per hour that the air in the entire room changes is estimated after considering the type of construction and the amount of ventilation expected from open doors, windows, exhaust fans, and ventilating systems.

The success of the air change method depends, in large measure, upon the skill and judgment of the estimator. Much of the divergence between estimates and actual results can undoubtedly be traced to improper estimation of air changes.

Air changes commonly used in practice vary from ¾ to 3 air changes per hour, according to circumstances. The choice of the air change factor depends on the use to which the building is put (as far as it affects the opening and shutting of doors and windows), and on door and window construction, but there probably is no rational method of selection. Experience with similar construction in the same line of business is the safest guide.

A common cause for high estimates is the neglect of heat gains from lighting, people, and appliances. In extreme cases, such as brightly lighted and crowded stores, the heat gains may be sufficient to carry most of the heating load of the premises.

On the other hand, certain enterprises require large quantities of cold material to be brought in from out-of-doors. This immediately starts absorbing heat from its surroundings and equipment must be made large enough to heat the cold material with reasonable speed in order to maintain the inside temperature. If this heat requirement is not included when the estimate is made up, the actual bills will exceed the estimates, and complaints of unsatisfactory heating may be expected as well.

In many cases, temperature schedules used as a basis for estimates are not to be adhered to in actual operation. This may affect the gas consumption materially. The necessity for relatively higher temperatures may sometimes be foreseen as when workers sit with their backs toward large areas of windows.

It is better to attempt to evaluate these factors and make as accurate an estimate as possible, rather than to provide a safety factor big enough to cover all variables. Providing such a safety factor raises the estimates on the majority of the jobs, which do not need it, for the sake of the occasional high job.

Gas Consumption Calculations

After the heat loss has been carefully estimated, the following equation may be used to estimate the annual gas consumption:

$$\text{Btu required per season} = \frac{\text{Btu loss per hour (under design conditions)} \times 24}{\text{Design Temperature Difference}} \times \frac{\text{Degree Days per season (at average temperature)}}{\text{Efficiency of Heating System}}$$

The average temperature is determined from the temperature schedule by multiplying each temperature by the number of hours it is maintained, adding these products, and dividing the sum by the number of hours, thus:

70° x 10 hours per day x 5 days per week =	3500
60° x 14 hours per day x 5 days per week =	4200
50° x 24 hours per day x 2 days per week =	2400
	10,100

$$\frac{10{,}100}{168 \text{ hours per week}} = 60.1° \text{ or } 60°$$

average temperature for week

Suitable efficiencies for use in the above equation may be obtained from the following table:

Vented Appliances	
Unit Heaters	82%
Circulators and Gas Steam Radiators	82%
Central Heating Equipment	70-76%
Unvented Appliances	90%

These efficiencies represent actual results obtained in practice, and allow for flue and piping losses.

Sizing Equipment

The heat loss of the building in B.t.u. per hour should be multiplied by the following factors to obtain the input to the heating equipment in B.t.u. per hour:

	Multiply Heat Loss by Factor to get Input B.t.u.
Vented Equipment	
Unit Heaters	1.4—1.5
Circulators	1.5
Gas Steam Radiators	1.5
Unvented Equipment	1.3

The factors in tables 43-47 of "Comfort Heating," published by the American Gas Association, are recommended for sizing steam and hot water boilers and warm air furnaces.

The smaller factor for vented unit heaters is recommended only when it is desired to size the equipment as close to the heat loss as possible, in order to save on first cost and gas consumption. This can be done only where rapid pickup is not important.

GENERAL INSTRUCTIONS

Types of Equipment Recommended

Central heating systems produce more satisfactory results than unit heaters or space heaters. Installation and operating costs are higher for central systems. Where a central heating system already exists, it is usually preferable to convert this to gas, either with a conversion burner or with a gas designed boiler or furnace. Floor furnaces and heat towers, when properly used, give good heating satisfaction. The choice of equipment is frequently influenced by the customer's ability to pay.

Don'ts

Install unit heaters where people are seated.
Use high speed fans where noise is a factor.
Install unit heaters where partitions or other obstacles exist or may be erected.
Install unit heaters where cold floors are a problem (unless cold air return is brought from the floor to the heater).
Install unit heaters where animals are housed as in pet shops or laboratories.
Install unit heaters in florist shops.
Place units where hot air blasts will be objectionable.
Attempt to spot heat a small portion of a large inclosure.
Place unit heater over door leading to unheated rear room and expect heater to heat rear room.
Install unit heaters in small stores.

Do

Use auxiliary heating in rear rooms of stores heated with unit heaters.
Install nozzles or cold air return ducts on unit heaters when ceiling is over 10 feet high.
Use floor furnaces, circulators, or heat towers in stores, rather than unit heaters.
Use unit heaters where fire hazard is present at floor levels.
Use warm air furnace and duct work where occupied balconies are in heated area, rather than unit heaters. Heat main floor, balcony will be heated by convection. If clerical workers occupy balcony, place thermostat there.

HEATER LOCATION

General Instructions

Blower type unit heaters may be located near rear of space, delivering heated air through ductwork.

The existence or possibility of installing a flue is often the deciding factor in the location of heating equipment.

The coverage of a unit heater depends on outlet air velocity, air temperature, height of heater, and angle of discharge. The distance of blow of a fan type unit heater is less than 7% of the outlet velocity in feet per minute. For blower type unit heaters, the distance of blow may be as high as 10% of the outlet velocity in feet per minute. Fan type heaters should not be required to blow more than 40 to 50 feet. When air is blown down, the distance of the blow is reduced 4% for each 5 degrees of downward deflection. High temperatures reduce the coverage.

Use space heaters to solve partition problems in area heated by unit heaters.

Place gravity heaters near cold areas. Blow toward areas of greatest heat loss (for all heaters that blow); away from places where exact maintenance of temperature is not so important. Place heaters near and blowing at large sources of infiltration, such as shipping platform doors.

In large areas blow parallel to walls, causing air to flow in a circular motion along exposed walls. Place extra units toward center of room to overcome roof heat loss.

When units are in center of space, blow toward outside walls.

Unit heaters should be at least 18" from side wall.

Gas company rulings, fire ordinances, and building codes must be observed carefully in the installation of equipment.

Use return air ducts with unit heaters wherever possible to reduce the possibility of cold floors.

Thermostat Location

The thermostat should be in a location that truly represents the average conditions in the space being heated. It should be located in a protected position, away from drafts, cold wall, and the direct blow of heaters.

If it is absolutely necessary to locate the thermostat on an outside wall, it should be protected from the wall by an insulating pad.

The thermostat should not be placed when the room air is pocketed.

In small or narrow places where one or two unit heaters are used, locate the thermostat on the wall alongside the heater, but not more than four feet behind or six feet in front of unit heater.

In a larger space, where air is circulated around the perimeter of the space, place the thermostats on pillars in the center of the room.

If partitions are to be installed, use temporary thermostat wiring until the partitions are built and a permanent thermostat location can be decided upon.

Thermostats may be hung directly under unit heaters.

Flue Connections

Transite, copper, and galvanized steel are all being successfully used as flue materials. The use of metallic chimneys has been questioned, because of the fire risk caused by the possible corrosion of a metal pipe at the point where it passes through the roof. Flue connections through combustible roofs are made by means of ventilated insulating sleeves.

Flues should extend at least two feet above all nearby objects to insure freedom from backdraft.

All heating appliances except space heaters must be vented, and these should be vented.

Where tile-lined chimneys already exist, these furnish ideal gas appliance vents.

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C. A. Brudin, who has been associated with the Washington, D. C., branch of Ruud Manufacturing Co. for several years, has been appointed district manager of the company at Baltimore, Md. E. P. Game, formerly at Baltimore, has been transferred to Charlotte, N. C.

Determination of the Combustion Characteristics of Fuel Gases

By

Louis Shnidman

Rochester Gas & Electric Corporation
Rochester, N. Y.

Procedure for Determining the Combustion Characteristics of Fuel Gases

THE COMBUSTION of fuel gas with air on a burner has been and continues to be an important factor in the development of modern society. The production, transmission, and distribution of fuel gases have developed into one of the leading industries in the United States.

The control of fuel gas quality has become an important problem in our industry. Recent attempts to define and measure the "Combustion Characteristics of a Fuel Gas" have indicated that it is a more complicated phenomena than was formerly suspected. To-date no acceptable unit, which is readily obtainable and generally applicable for measuring the combustion characteristics of a fuel gas, has been discovered. In view of this situation, a procedure is outlined in this paper, which if followed, will eliminate the difficulties and disadvantages of the methods of the past.

In the early days of our industry when gas was used primarily for lighting, its combustion characteristics were measured by its candle power value. This was a direct and practical test. As the application of gas in the fields of cooking and heating expanded, the candle power test no longer sufficed. Fuel gas was now being used mainly for heating, and as a result the Heating Value of the gas was measured. This was also a direct and practical test. It soon became apparent that heating value alone had its limitations. In addition to maintaining a constant heating value, the specific gravity of the gas had to be held within limits. Thus, by controlling the heating value and the specific gravity of the gas within narrow limits so long as the method of manufacture remained the same, the combustion characteristics of the gas also remained constant. It was also discovered that components in the gas; i.e., its composition, affected the combustion properties of a gas. With the development of new methods of manufacture and the mixing of different types of fuel gases, the importance of composition became more evident. The industry now had at its disposal the control of heating value, specific gravity, and composition to maintain a gas of given combustion characteristics.

The rapid development of our industry and the increase in the types of gases available as coal gas, blue gas, carburetted blue gas, refinery gas, liquefiable gases, natural gas, mixtures of the above, etc., made it more difficult to control the combustion characteristics of the gas. Different gas mixtures, in order to be interchangeable, require careful control of the heating value, specific gravity, and composition within narrow limits.

In order to simplify the problem, a number of gas quality index factors calculated from the physical properties of the gas have been proposed. Among these the American Gas Association Index C appears to have certain advantages. In order to obtain this factor the gross heating value, specific gravity, and complete analysis must be made available, and the calculation itself is long and tedious. The final results are questionable without some experimental confirmation.

Test burners of various designs have been suggested for use as a measure of gas quality and its combustion properties. The test burner provides a comparison of the cone-forming properties; flashback, and blowoff characteristics of flames of different gases as they are burned on a burner. The results are all expressed in independent and empirical scales. The test burner can be employed only after these scales have been calibrated in terms of the gases similar in character and composition to those which are to be studied.

The advantage of the test burner, over any other method yet proposed as a measure of the combustion characteristics of a gas, lies in the fact that it is a direct test which corresponds more closely to actual application. After the original calibration is completed, test results may be obtained quickly, easily, and directly. Furthermore, additional information concerning relative flame stabilities may also be obtained by simple readjustments of the air or gas supply to the test burner, and the effect upon relative cone heights, flashback, or flame lifting tendencies, may be studied.

The test burner used in this work and called the Rochester Test Burner was simple in design and readily portable. A full and detailed description of its design and operation is described in the report that follows. The Rochester test burner was used in collecting a considerable amount of data for a variety of gas mixtures which included the following: coke oven gas, producer gas, flue gas, blue gas, carburetted blue gas, natural gas, and mixtures of any and all of these.

The attached paper by Mr. Yeaw (a summary of which follows) and the author presents this large amount of detailed data with full discussion with regard to its application and importance in controlling the quality of gas, and determining its combustion characteristics. For all such details, reference should be made to this attached paper.

To determine and measure the combustion characteristics of a fuel gas or mixture of gases, the following procedure is presented.

First select a burner to be used as the Test Burner similar in design to the Rochester Test Burner, having appropriate scales and air-

Presented before the Technical Section at A.G.A. Convention, Atlantic City, N. J., Oct. 9, 1940.

shutter adjustments. The Rochester Test Burner is described in detail in the attached paper by the author and Mr. Yeaw.

Next calibrate the Test Burner on the gas in use, recording its burner number, flashback value, blowoff or flame lifting point, and the total flame height. These results will be expressed in independent and empirical scales.

Employing the calibrated Test Burner, secure similar data; viz., burner number, flashback value, blowoff point, and total flame height on the gas or mixture of gases to be substituted or used interchangeably with the gas now in use.

Where the analysis, heating value, and specific gravity of the gas or gases under study are available, calculate the A.G.A. Index C factor. Index C is related to the burner number and gives additional data relating to the combustion characteristics of a fuel gas. This relationship and much detailed data are presented in the attached paper that follows.

The foregoing data can be obtained in a relatively short time and requires only small volumes of gas. In most cases these data will be adequate. Where large or unlimited amounts of gas are available, additional practical tests should be performed employing various burners in appliances like ranges, water heaters, refrigerators, and gas househeating installations. In such tests the nature of the flame—its total height, the height of the inner cone, its flashback tendency, its blowoff tendency, and yellow tip range—should be observed and recorded. The air-gas ratio in the burner head should be measured in the above cases as far as possible. Such data should be collected on the various types or mixture of gases under study. A careful analysis of these data will indicate the interchangeability of the various gases and their combustion characteristics.

As a practical example, let us consider the gases presented in Table I. Here are found the analysis of the gas, the heating value, the specific gravity, theoretical air required for combustion, A.G.A. Index C, burner no. (B) flashback (F.B.), flame height (F.H.), cone height (C.H.), etc.

TABLE I

MANUFACTURED GASES

Carburetted Blue Gas, %			100%	16%
Coke Oven Gas, %	(Reference	76%		66%
Producer Gas, %	Gas)	24%		18%
CO_2	3.1	3.4	5.7	3.1
Ill	3 9	3.9	7.3	4.0
O_2	0.2	0.1	0.1	0.2
CO	11.0	11 8	23.5	12.9
H_2	44.1	38.5	34.5	43.7
CH_4	26.2	28.0	19.7	25.4
N_2	11.5	14.3	10.0	10.7
B.t.u.	540	545	545	540
Specific Gravity	.515	.546	.614	.500
Theoretical Air	4.569	4 632	4.688	4.544
A.G.A. Index C.	1.000	.982	.863	1.016
Burner No. (B)	69	68	45	67
Flashback (F.B.)	160	142	100	138
Flame Height (F.H.)	3.0	3.0	3.0	3.0
Ratio FB/B	2.1	2.1	2.2	2.1
Cone Height, B = 69	1.0	1.0	0.4	1.0

In column 2 of Table I there is presented a Reference Gas showing its analysis, a B.t.u. of 540, a specific gravity of 0.515, 4.569 cu. ft. of air required for theoretical combustion, an A.G.A. Index of 1.000, a burner number of 69, a flashback number of 160, a flame height of 3.0, and a cone height of 1.0. Consider further column 3, a manufactured gas consisting of 76 per cent coke oven gas and 24 per cent producer gas. Its analysis is somewhat different from the reference gas, the B.t.u. is slightly higher, and the specific gravity is higher. It requires somewhat more theoretical air and has an A.G.A. Index of 0.982. Its burner number is 68, a flashback of 142, a flame height of 3.0, a ratio of FB/B of 2.1, and a cone height of 1.0. The A.G.A. Index C being less than one indicates that this gas would be somewhat harder than the reference gas, since the adjustment range in terms of Index C lies between .85 and 1.15 for an ideal substitute gas. The burner number of 68, flashback of 142, flame height of 3.0, ratio of FB/B of 2.1, and a cone height of 1.0 shows that this gas has combustion characteristics as indicated by the test burner, very similar to the reference gas. No difficulty will be encountered in substituting one for the other.

Consider now the gas in column 4, representing 100 per cent carburetted blue gas which is distinctly different than the analysis of the reference gas. The B.t.u. is slightly higher, the specific gravity considerably higher, the theoretical air only slightly higher, and an A.G.A. Index of .863, which would indicate that this gas flame would be distinctly harder than the reference gas and is approaching the lower limit or .85 for complete interchangeability. Thus, the A.G.A. Index C would indicate that this gas would operate satisfactorily, but nevertheless would be somewhat harder. On the other hand, the data from the test burner showed a burner number of 45, a flashback of 100, a flame height of 3.0, a ratio FB/B of 2.2 and a cone height of 0.4. For satisfactory operation a gas to be substituted for the reference gas would show a burner number ranging between 52 and 90. Values lower than 52 indicate that the flame would be hard and thereby have definite tendencies towards flashback difficulties. In this case the burner number being 45, difficulty with flashback troubles could be expected with the use of this gas. The cone height is only 0.4 normally indicating the flame would be very hard. Likewise, the flashback number of 100 indicates tendencies in that direction.

Consider again the gas in the last column, representing a mixture of 16 per cent carburetted water gas, 66 per cent coke oven gas, and 18 per cent producer gas. The analysis of this gas is somewhat similar to the reference gas. The specific gravity, B.t.u., and theoretical air are similar. It has an A.G.A. Index of 1.016, a burner number of 67, a flashback of 138, a flame height of 3.0, a ratio FB/B of 2.1, and a cone height of 1.0. In this case the A.G.A. Index C and burner number and test burner data indicate that the gas would be completely interchangeable with the reference gas, and no difficulty would be encountered when using this gas.

The problem of determining the combustion characteristics of a fuel gas is not simple. A large number of factors are involved. A procedure has been outlined above which will aid in determining the combustion characteristics of a fuel gas. A complete and detailed discussion of the various factors of this procedure are outlined in the attached paper by Mr. Yeaw and the author.

Abstract of Report

The Test Burner and Its Application in the Control of Gas Quality

By

Louis Shnidman and Jesse S. Yeaw

Rochester Gas & Electric Corporation
Rochester, N. Y.

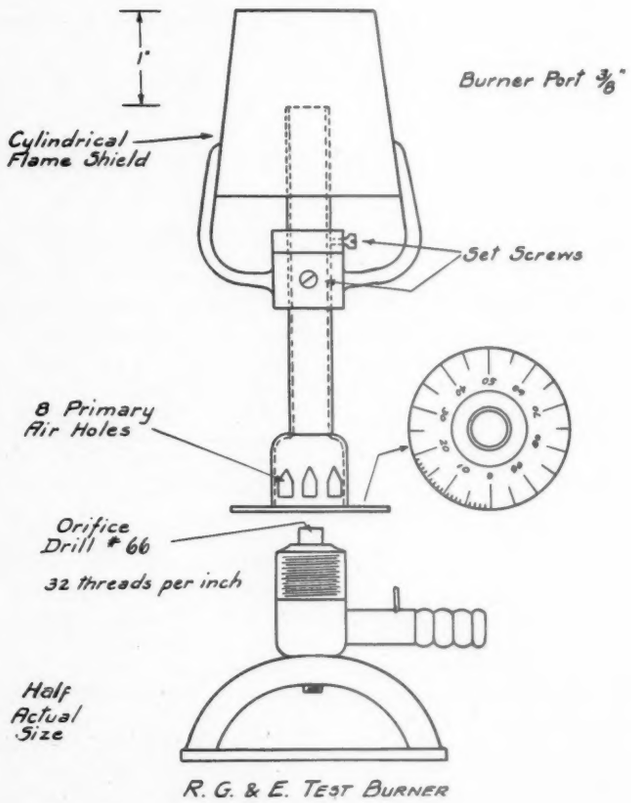

Figure 1. Specifications for the Test Burner.

R. G. & E. Corp. Test Burner

The test burner used in the present work consisted of an ordinary laboratory bunsen burner, the air shutter of which was fitted with a graduated scale. The adjustable orifice was removed and replaced with a fixed orifice, and an adjustable flame shield was used on the barrel of the burner to aid in noting the cone height. Gas pressure to the burner was regulated at 3 inches water by means of two small dry regulators acting in series with a purge burner placed between them. Specifications for the burner are shown on Fig. I, and a photograph of the complete portable set-up is shown on Plate I.

This type of test burner was chosen because of its simplicity of construction and its consequent inexpensiveness. It is easy to adjust and is readily portable.

The procedure for using the test burner is as follows:

1. Connect up inlet rubber tubing to the gas supply to be tested.
2. Turn on the gas supply and light purge and test burners.
3. Open up bypass T to the manometer carefully, and then adjust the gas pressure to the burner at 3 inches water by means of the two regulators and the adjustable orifice of the purge burner. This regulation is usually accomplished at one point under ordinary circumstances.
4. Raise the flame shield to the stop provided, and adjust the primary air so that the inner blue cone of the flame is even with the top of the flame shield. At this point the blue cone is exactly one inch in length.
5. Read the scale provided and record the Burner Number for the gas.

The interpretation of the readings will vary according to the requirements and conditions. In Rochester the normal or average reading for B (burner number) should be 69. Readings as low as 52 would indicate backfiring tendencies, while readings above 85 would indicate long flames and yellow tips.

It has been found that, if a given burner be operated without readjustment of any kind, at a fixed pressure, but supplied with gases of different specific gravities, the volume of air injected per hour can be expected to be nearly constant. As the gas rate for a given pressure is inversely proportional to $\sqrt{d}$, this means that the air-gas ratio may be expected to be directly proportional to $\sqrt{d}$.

A number of gas mixtures of varying density were burned upon

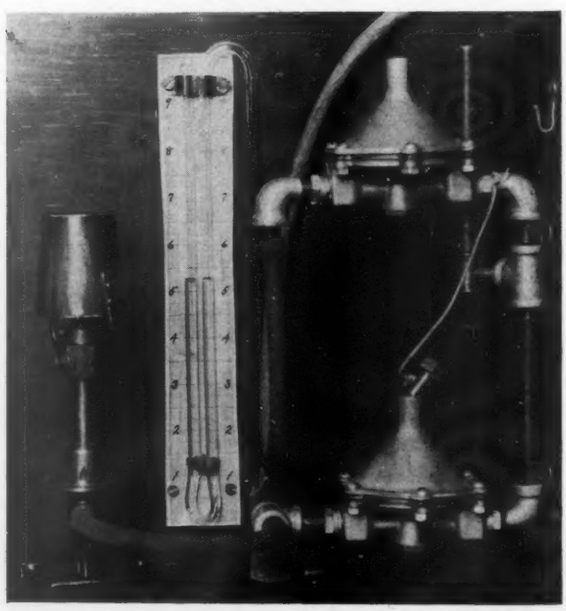

Plate 1 Shows connections, Regulators and Manometer.

the test burner, and samples of the primary air-gas mixtures were taken as has been previously outlined. From the analyses of these samples the air-gas ratios were determined, and the relationship indicated in the previous paragraph was found to be closely confirmed. Thus the burner numbers can be quite clearly interpreted into terms of air-gas ratios when the specific gravity of the gas is known.

These relationships can be expressed by the following equation.

$$R = K\frac{B}{100} + K$$

R = Air/Gas Ratio
$K = .57 + 2.5\,d - .875\,d^2$
d = specific gravity of gas (air = 1)

Summary

The control of gas quality has become an important problem in the gas industry. The recent efforts to define and measure this property of gas mixtures has revealed that the combustion of gas with air on a burner is a much more complicated phenomena than was formerly suspected. It is significant to find that no acceptable unit, which is readily obtainable and universally applicable as a measure of the combustion characteristics of a fuel gas, such as might correspond to the generally accepted calorific value, has yet been discovered.

Several gas quality index factors calculated from the physical properties of the gas have been proposed. Among these the A.G.A. Index C appears to have certain advantages. In order to obtain this factor the gross heating value, specific gravity, and complete analysis, must be made available, and the calculation itself is long and tedious. The final results are questionable without some experimental confirmation.

Test burners of various designs have been suggested for use as a measure of gas quality. The purpose of the test burner is to provide a comparison of the cone forming properties of the flames of different gases as they are burned on a burner. It appears that one test burner is about as satisfactory as any other except for mechanical refinements which enhance the accuracy of one over another. The results are all expressed in independent and empirical scales, and the test burner can be employed only after these scales have been calibrated in terms of the gases similar in character and composition to those which are to be checked.

The advantage of the test burner, over any other method yet proposed as a measure of the combustion characteristics of a gas, lies in the fact that it is a direct test which corresponds closely to actual practical application. After the original calibration is completed, test results may be obtained quickly, easily, and directly. Furthermore, additional information concerning relative flame stabilities may also be obtained by simple readjustments of the air or gas supply to the test burner, and the effect upon relative cone heights, flashback, or flame lifting tendencies, may be studied.

The test burner used in this work was simple in design and therefore inexpensive. It was also readily portable, and, although probably less accurate than some of those recently described in the literature, it was considered to be sufficiently exact for all practical purposes. This paper includes a considerable number of experimental test burner data for a variety of mixtures of:

Coke Oven Gas
Producer Gas
Flue Gas
Blue Gas
Carburetted Water Gas
Natural Gas
Mixtures of any and all of these

All possible mixtures of coke oven gas, producer gas, and carburetted water gas were tested with the burner, and a series of data were obtained showing the proper proportions of each of these gases necessary to yield gas mixtures of certain prescribed gas quality.

It has been shown that flue gas and low B.t.u. blue gas and by inference, that other low B.t.u. gases can be substituted for producer gas in the preceding mixtures, due consideration being given to the calorific value of the product thus prepared.

The introduction of more than 10% natural gas into mixtures of manufactured gases is likely to result in sudden and profound changes in the combustion characteristics of these mixtures which may not be reflected by the test burner number alone. Such changes may be indicated, however, if flashback or blow-off points are also determined. In this detail, if in no other, the test burner is far superior to any calculated Index value. If the proportion of blue gas in a manufactured gas mixture is high, then the proportion of natural gas which may be introduced without causing blowoff or flame lifting tendencies may be increased to 25 per cent.

Neither test burner numbers nor any calculated Index value for mixtures of natural gas and flue gas or air are comparable with the corresponding data for manufactured gas mixtures. Corresponding burner numbers indicate similar types of flames, but other flame characteristics, not reflected in the burner number readings alone, show that these mixtures are not interchangeable with the usual manufactured gas mixtures under ordinary conditions.

It has been indicated in the experimental work that the normal average fuel gas distributed in this locality should have a burner number of 68 to 70, and that, if the burner number falls below 52 or above 86, the combustion characteristics of the gas mixture may be so changed that customers may be troubled by flashback conditions or by soft flames, yellow tips, and soot formation, respectively.

In general test burner numbers increase as the calorific value of the gas increases, although different types of gas of the same heating value do not necessarily have similar burner numbers. One of the principal reasons for this lies with the differences in specific gravity of such mixtures.

The primary air-gas ratio, which is of great importance in determining the operating characteristics of most gas burners, is largely dependent upon the specific gravity of the combustible gas. The interrelation of B (burner number), h (heat value), and d (specific gravity) for a considerable variety of gas mixtures was found to be expressed by the following equation:

$$B = .3\frac{h}{\sqrt{d}} - 160$$

By means of this relationship it has been shown that, if h is constant at about 540, d may be varied from .500 upward 19 per cent or downward 13 per cent for interchangeable mixtures. If on the other hand, d remains constant at .500, h may be varied 7 per cent upward or 8 per cent downward from the 540 average.

This expression can also be used for the calculation of compensating specific gravity data or heating values which it would be necessary to obtain in order to maintain constant test burner numbers or consistent combustion characteristics for a gas which had been changed from the normal or average gas ordinarily dis-

(Concluded on page 54)

Gas at the National Metal Show

The broadest single effort of the gas industry to approach its customers through the medium of operating equipment displays at national expositions, is, without doubt, its participation each year in the National Metal Congress and Exposition through the medium of the A.G.A. Combined Industrial Gas Exhibit. This year the event was doubly important because the metal and metal working industries constitute one of the most significant factors in our national defense program — and have long been considered to be the largest national industrial customer of the gas industry.

Sponsored by the Industrial Gas Section of the American Gas Association working in cooperation with 20 nearby gas utility companies and 15 manufacturers of gas-using equipment for the metal industries, the A.G.A. Combined Industrial Gas Exhibit this year covered over 6,500 sq. ft. of floor space in Cleveland's Public Auditorium during Metal Show week, October 21 to 25 inclusive, and included the best in gas-burning equipment for almost every conceivable type of heating job any metal industry plant might encounter. To tie the 15 cooperating manufacturers' displays together into a unified whole (forming the largest single exhibit at the Metal Show), massive blue pylons, connected by buff overhead beams, encircled the joint rectangular area. Large lettering on these beams proclaimed important merits of gas heat with slogans such as, "On the Button Control," "Better Shop Conditions," "Higher Quality," and "Better Heat Treatment." In addition, the extra-height backwall of the lounge space at the end of the main entrance aisle sported the slogan of the Combined Exhibit "Now More Than Ever INDUSTRY NEEDS SPEED In Production — and SPEED MEANS GAS Heat," under which, in turn, spread a 12-foot chart showing the annual growth of the industrial gas load as over and against the annual growth of business activity. Emphasis was placed upon the fact that the industrial usage of gas for the first six months of 1940 was 50.4% above 1929 whereas geenral business activity for this same period was only 5.8% above the 1929 normal. A special point on the chart marked by a gas flame indicated that in the year 1939 no less than 1,060,379,800,000 cu. ft. of gas were sold to American industry. This central lounge acted as headquarters for the A.G.A. staff, and as a convenient conference space for the many industrial gas engineers from utility companies who attended the Show with customers or prospects.

In all, some 250 pieces of industrial gas equipment were shown in the Combined Exhibit to over 40,000 metal folk who registered to inspect the Exposition. Much of the gas equipment was in operation, or otherwise animated by motion, color or explanatory slogan—to the extent that a new high in dramatic value was attained for cooperative gas industry exhibits. In the neighborhood of 100 industrial gas men manned the space at all times, 84 of these representing the 15 cooperating producers of equipment, and the remainder comprised of American Gas Association staff members and industrial gas men from utility companies who volunteered their services. The East Ohio Gas Company, particularly, kept several men on the floor continuously during Exposition hours.

In orders, in sales leads, in stimulated customer interest, and in advertising value, the 1940 A.G.A. Combined Industrial Gas Exhibit at the National Metal Congress and Exposition topped all previous records.

Those gas companies who contributed to make the Combined Exhibit possible were: Battle Creek Gas Co., Binghamton Gas Works, Consumers Power Co., The Dayton Power & Light Co., The East Ohio Gas Co., The Empire Gas & Fuel Co., Ltd., Equitable Gas Co., Hope Natural Gas Co., Johnstown Fuel Supply Co., The Manufacturers Light & Heat Co., Michigan Consolidated Gas Co., Monongahela West Penn Public Service Co., New York State Electric & Gas Corp., Northern Indiana Power Co., Northern Indiana Public Service Co., The Ohio Fuel Gas Co., The Peoples Natural Gas Co., Republic Light Heat & Power Co., The River Gas Co., and United Fuel Gas Co. The 15 exhibiting manufacturers of equipment were: American Gas Furnace Co., Burdett Manufacturing Co., Continental Industrial Engineers, Inc., Despatch Oven Co., Eclipse Fuel Engineering Co., Fieser-Lundt, Inc., The Gas Machinery Co., Charles A. Hones, Inc., The C. M. Kemp Mfg. Co., National Machine Works, North American Manufacturing Co., The Partlow Corp., The Selas Co., Sellers Engineering Co., and The Surface Combustion Corp.

Part of the Combined Industrial Gas Exhibit at the National Metal Exposition.

The A.G.A. Industrial Gas Section Committee in charge of the effort was chairmanned by Karl Emmerling, Industrial Fuel Engineer, The East Ohio Gas Co., Cleveland, and was composed of W. R. Teller, A.G.A. Testing Laboratories, Cleveland, and Eugene D. Milener, Secretary.

J. T. Sutliff Appointed to Roots-Connersville Chicago District

Announcement has been made by the Roots-Connersville Blower Corp. of Connersville, Ind., that J. T. Sutliff is now in charge of the company's Chicago office which is located at 122 South Michigan Avenue.

Mr. Sutliff, who succeeds the late Wm. Townsend, has been connected with Roots-Connersville for many years, and prior to going to Chicago in 1935 he was located at the factory.

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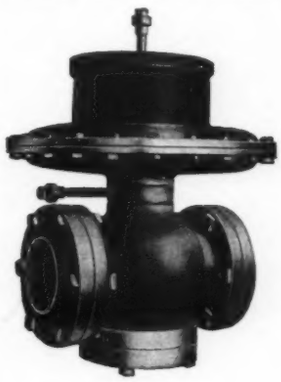

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High-Temperature Gas-Fired Test Furnace*

By C. L. Thompson and Herman G. Wilcox

A high-temperature, gas-fired test furnace, capable of maintaining temperatures above 1725° C., is described. Neither the air nor gas is preheated. Features of the furnace are uniform temperature distribution, ease of control, and quiet operation.

I. Furnace Construction

A HIGH-TEMPERATURE, gas-fired test furnace, built about two years ago, has given such gratifying results that a brief description of the furnace should be of interest.

The furnace is of conventional downdraft design and has a hearth measuring 2 ft. 6 in. by 3 ft. 4 in. and a height of 2 ft. 4 in. at the center. Firing spaces behind 4½-in. flash walls on each side of the furnace increase the total inside width to 4 ft. 2 in. The furnace has a maximum capacity of thirty-nine 9-in. straights set on edge for reheat tests or of about two hundred 9-in. straights set for firing.

The lining, flash wall, floor tile, piers, and all parts subjected to extreme temperatures are built of 90% alumina brick. The crown and side walls are 9 in. thick; in all other parts 90% alumina brick, 4½ inch in thickness, are used.

As much insulation was used as seemed practicable, consisting of 4½ in. of insulating firebrick of the 2600°F. group backed with 4½ in. of insulating firebrick of the 2000°F. group. In the side walls, the outer layer of insulation was cut to 2½ in. The use of insulation on such furnaces presents problems in bracing the kiln, which have been met by the use of solid-wall construction behind the buckstays. The angle iron that supports the roof skews is set on these extensions and the inner end of the skews rests on the furnace side wall. The side-wall insulation stops about 2 inches below the skew angle, leaving a cooling space that prevents overheating of the iron.

The door arch used on the furnace has not held up well, but the design, shown in Fig. 1, has been used on a similar smaller furnace built subsequently and seems to solve the door problem. This design lends itself well to end-bracing of the crown, which is necessary to prevent a gradual opening of the rings of the crown.

II. Burner Equipment

The kiln is fired with natural gas without any preheating of air or gas. There are two sets of three burners on each side of the kiln; each set of burners has a capacity of 1000 cu. ft. of gas per hour. McKee universal burners are used, which fit tightly and discharge into refractory burner tunnels that are rammed in place in the furnace side walls. The material used for these burner blocks is a 90% alumina ramming mixture. The air for combustion is supplied by a Spencer turbo compressor with a capacity of 600 cu. ft. of air per min. at 1 lb. of pressure. The air is supplied by a manifold to a separate McKee proportional mixer for each set of burners. The method of manifolding is shown in Fig. 2. Atmospheric pressure in the gas line to the mixer is maintained by means of a zero governor, and the amount of gas drawn into the mixer is thus dependent on the velocity of the air in the mixer. For a given orifice setting in the mixer, the ratio of gas to air remains essentially constant from about one-fourth to total capacity of the burners. Each set of burners is separately controlled by a blast gate and is equipped with a manometer which simplifies kiln operation. There is a small lighting port in the front wall at each side of the door. These ports are equipped with atmospheric burners so arranged that they may be swung out after the other burners are lighted and the ports may then be closed with brick. These atmospheric burners may also be used for heating at slow rates below the range of the main burners when the kiln is used for firing ware.

III. Furnace Operation

Since the furnace was built, it has been operated on an average of once each week; most of the runs were reheat tests at 1600°C. or higher, with several at 1725°C. There has been no occasion to use the furnace above the latter temperature, but it is certain that the temperature can be brought up to a point somewhat higher because the burners must be turned down considerably during the early part of the period at that temperature. In the reheat tests, the furnace is heated at the standard rate shown in Table I and held at the specified temperature for five hours. In the high-temperature range, the furnace temperature is measured with a recording radiation pyrometer, checked by optical pyrometer readings. Experience has shown that it is easily possible to hold the temperature at the specified point, with a maximum variation of ± 10°F.

TABLE I
HEATING RATE USED IN REHEAT TESTS

Hours Start	Temperature (° F.)	Temperature (° C.)
1	1200	649
2	1800	982
3	2200	1204
4	2400	1316
5	2500	1371
6	2600	1427
7	2700	1482
8	2800	1538
9	2900	1593
10	3000	1649
11	3100	1704
12	3150	1732

In addition to the fact that high temperatures are easily attained, the furnace has other desirable features, such as ease of operation, uniformity of temperature over the hearth, and quiet operation. The operator

* *Presented at the Forty-Second Annual Meeting, The American Ceramic Society, Toronto, Canada, April 10, 1940 (Refractories Division).*

has only to regulate four blast-gate valves so that there is the same mixture pressure at each side of the furnace and, with a standard heating rate, a definite schedule of turnup is easily established. With the burner tunnels in good condition, the only requirement for uniform temperature distribution seems to be the maintenance of equal pressure of mixture at the two sides of the kiln; several checks with cones distributed over the hearth have shown a maximum variation of about ¼

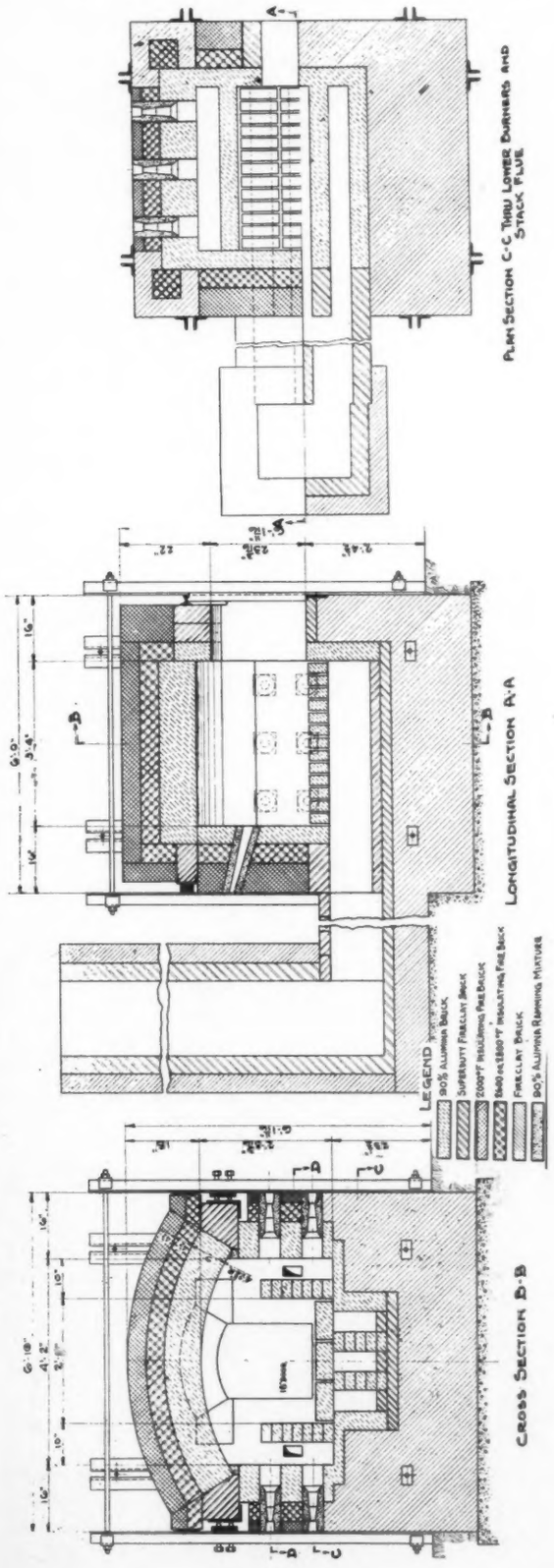

FIG 1.

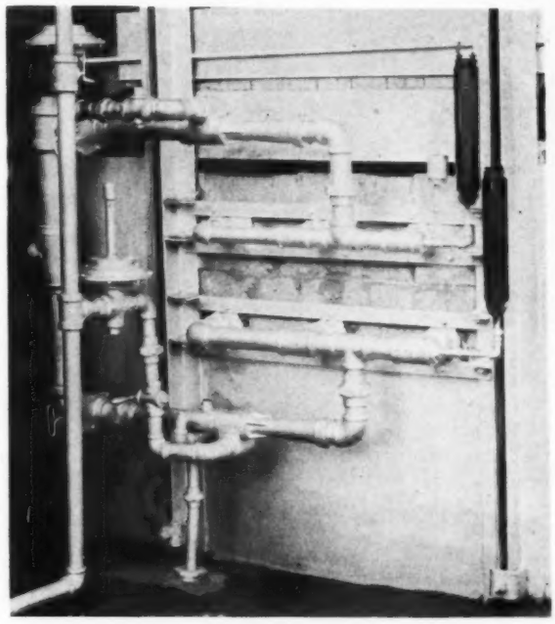

FIG. 2.

cone at cone 30. In contrast to the roar of the usual high-temperature test kiln, fired with high-pressure gas burners or with oil, this kiln can be heard only a short distance away. The blower operates quietly, and there is no irritating roar from the burners even at high furnace temperatures.

Acknowledgement

The authors express their indebtedness to the staff of the Industrial Sales Division, Equitable Gas Company of Pittsburgh, who calculated the heat requirements of the kiln and recommended the gas-burning equipment.

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Moving a High-Pressure Gas Holder

By
Fred A. Herr,
Los Angeles, Calif.

ONE of the most difficult engineering jobs of the year in Southern California has just been completed by the Southern Counties Gas Co. in the moving of a 245½ ton high-pressure gas holder at the Palm Springs desert winter resort.

Palm Springs is an exclusive winter resort, the rendezvous of film stars and wealthy socialites from many parts of the country. It is situated in the Coachella Valley district of the Colorado Desert in Riverside County, California, 100 miles east of Los Angeles.

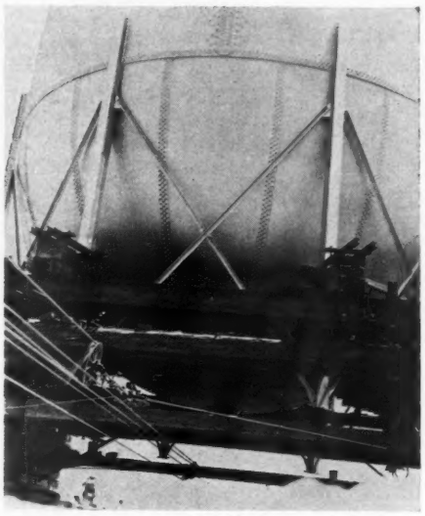
The compression tank is used to balance the gas load in Palm Springs and nearby Cathedral City and also serves as an emergency holder for the district, which is known for its "flash floods" that occasionally wash out the lines. Removal of the holder to a new location was prompted by protests of Palm Springs leaders that it constituted an eye-sore in its original location at the edge of the community.

Contract for moving the holder was awarded by the Southern Counties Gas Co. to the Kress House Moving Co. of Los Angeles at a cost of $13,700. The holder is 90 feet high, 35 feet in diameter, weighs 491,000 pounds (with the cradle for moving) and has a capacity of 200,000 cubic feet of gas.

The huge weight, the shape of the holder, the fact that it could not be laid on its side, and the desert terrain over which it was to be transported presented a number of difficult engineering problems. The climate of the Colorado Desert also entered into the picture. The work had to be done in summer, when Palm Springs is virtually deserted, for the gas supply could not be cut off in winter when the town has a temporary population of some 6,000. Because of the extreme heat, which soars to 120 deg. F. at mid-day, the moving had to be accomplished in the early morning hours before the sun reached the meridian. Kress Co. crews worked from 3:30 to 11:30 a.m. only, because it had been found that metal objects, such as cables, winches, tools and the holder itself became so hot under the blazing afternoon sun that they could not be touched safely by human hands.

The holder had to be moved to a position at the foot of the San Jacinto Mountains, about one mile west of its former location. The intervening terrain is composed of undulating sand dunes and areas of hard, flinty volcanic formation. George Kress, general manager of the moving firm, pointed out that the holder could not be laid on its side, which would have simplified the moving job, because its stress construction was designed for a vertical position only. To preserve equilibrium, a perfectly level roadbed had to be built. The moving company spent six weeks in preliminary work with surveyors, bull dozing crews and road building gangs. A mile of double-track railroad was then built along the leveled roadbed from Palm

(Continued on page 54)



The bracing and cradle arrangement in which the holder rested for its one-mile journey across the desert from the exclusive Palm Springs winter resort. The platform is of 60-foot steel I-beams; the uprights which support the 200,000 cubic foot tank of 20-foot H-bars. The rollers, and the wooden cross-beams shown in this photograph, were of orange wood, which is noted for its fibre and compression strength.

The 90-foot, 245½ ton gas holder resting in its cradle and ready for moving. Orange wood rollers, moving along a railroad track specially built for the purpose, were used. Power was supplied by a 7-ton truck anchored to redwood "deadmen," buried eight feet in the ground. The 491,000 pound load moved at an average rate of 300 feet per day.

More About the Sound Picture "Fun in the Kitchen"

This full color, all synchronized sound picture was initiated by the Pacific Coast Gas Association and jointly produced with the Association by Rodney Gilliam Company, Hollywood. Its objectives are: to identify the C.P. gas range; to stress dependable, convenient and economical cooking; to glorify the modern all-gas kitchen, and with it to instill in modern kitchen practice the notion that cooking is fun.

These are accomplished by the use of an all-star cast, which includes Hedda Hopper of stage, screen and radio fame, who is also a newspaper columnist; Don Wilson, America's Number One radio announcer; Manton Moreland, colored character actor, whose popularity has increased with successful parts in major Hollywood productions.

The picture embraces 27 minutes of fast-moving entertainment, concluding with a colorful parade of delicious foods. It is designed for use in cooking schools, service clubs, women's clubs, schools, churches, etc. Each print delivered to purchasing gas companies includes a custom-made first title with individual company signature.

Many companies to date have secured prints and report successful showings and many bookings as far ahead as April. Audience reaction to the foods and the operation of the appliances and the general good humor of the dialogue has been uniformly excellent.

Come an' get it! Hedda Hopper sounds the mess gong. Dinner chimes are good news in any man's language.

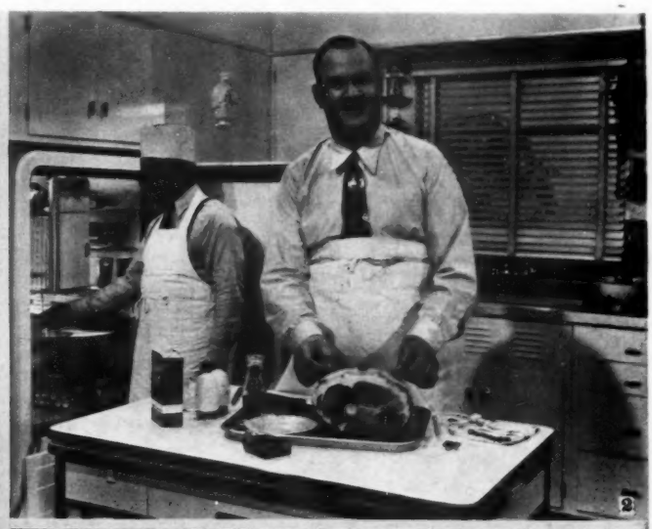
By syndication, prints of this costly production are available at a very low price. Requests for information or orders should be addressed to the Rodney Gilliam Company, Hollywood, California.

1:—Corner of the All-Gas Kitchen shows modern CP Range and planning center.

2:—Don Wilson decorates the baked ham while Mantan reaches into the Servel refrigerator with illuminated interior.

3:—Mantan tells Don Wilson that he doesn't exactly feel ill but that there is "just something about onions that does things to him".

4:—The table spread, Mantan offers fried chicken to the audience. Says he—"Bird o' Pahadise comin' raht up".



25th National Hotel Exposition

61,255 Purveyors Study 46 Advanced Gas Cooking Units at A. G. A. Combined Display

In November each year the National Hotel Exposition, held at Grand Central Palace, New York City, offers to the gas industry the opportunity of displaying the latest in gas-fueled food service equipment to the largest aggregation of hotel and restaurant men which assembles together at any one place or time. This year, through the medium of an A.G.A. Combined Gas Display, sponsored jointly by the Industrial and Commercial Gas Section of the American Gas Association and the Consolidated Edison Company of New York, Inc., no less than 46 up-to-the-minute gas units for commercial cooking were displayed in a single exhibit before 61,255 users or potential users who attended the Show, November 11-15.

The equipment shown filled the entire North wall of the main exhibit floor, and included the latest models produced by: Standard Gas Equipment Corporation, American Stove Company, Detroit Michigan Stove Company, The G. S. Blodgett Company, Inc., J. C. Pitman & Sons, Inc., and Ershler & Krukin, Inc. Each manufacturer was allotted a separate section of the space at the foot of a giant sawtooth backwall of uniform design and colorful effectiveness.

At right angles to the length of the display and covering 30 ft. of front end-wall was an American Gas Association panel, proclaiming gas an automatic, fast-heating, economical fuel. Six component panels in this area featured the virtues of gas for refrigeration, cooking, water heating, space heating, processing and manufacturing, and air conditioning. The Consolidated Edison Company signature surmounted an inset niche which framed a continuous rotating picture story of gas at work in the kitchens of well-known hotels and institutions in New York City.

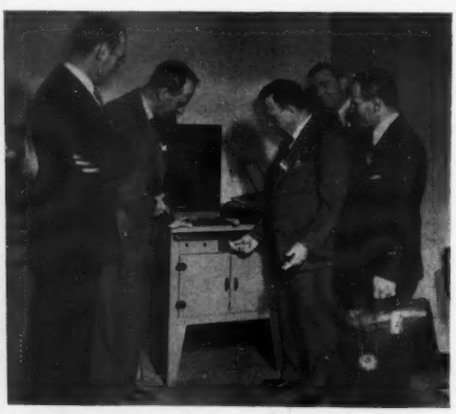
New Designs Make Food Service Equipment News

More than the usual quota of ingenuities and innovations was apparent in the displayed equipment this year. For example: the Magic Chef "gear shift" raising and lowering device for the broiler rack which provides feather-touch adjustment, eliminates handles near the heat zone, and obviates grease-catching mechanisms on the inside sides of the broiling compartment . . . Vulcan's 50th anniversary "Stream Line," in an easy-to-clean crinkle finish . . . Blodgett's all-welded redesigned deck ovens with auxiliary heat retarders for light bottom baking, such as long-bake cheese cakes, pound cakes and Danish pastries or high-ratio cakes and breads . . . Garland's fuel-saving broiler - and - fry - top combination, matching in with its handsome battery . . . Frialator's simplified snap-acting thermostatic control for greater fat-temperature recovery . . . the waterless Thermolator steam table, which offers sectional firing of various groups of canisters and trays, reduced fuel consumptions, faster food warming-up times, and less heat and humidity discharge into kitchens . . . Vulcan's solid plate range-oven rack for larger satisfactory oven loadings . . . the new Magic Chef louver diverter for manual control of deck oven bottom heat by combustion product deflection . . . deep fat fryers with larger immersion tubes in the fat, for faster heat transfer and better temperature response . . . Blodgett's positive spline-gear connection between thermostat dial and valve . . . the Vulcan's "expando" half-width range sections and improved pilot for lighting all or any individual rings of hot-top burners and the extra-large Garland fry-top.

Other exhibitors, not in the A.G.A. combined space, also made news on the gas-fired food service equipment front. Among these especial attention was won by: Masterchef Products' counter Roto-Broiler . . . Anetsberger Brothers' and Majestic's thermostatically-controlled counter griddles . . . Savory's hint of a gas-fired pop-up toaster . . . the dish-washer manufacturers' World's Fair models providing utensil sterilization in conformity with the strictest public health regulations . . . numerous thermostatically-controlled coffee urns of advanced design . . . and Anetsberger's adjustment of deep fat fryer basket position for surface frying of oysters, lobsters, and other fragile foods.

Gas Industry Attendance High

The entire joint exhibit was planned and made possible through an A.G.A. committee chairmanned by John J. Dunne, Supervisor, Commercial & Industrial Division, Consolidated Edison Co. of New York, Inc., and was executed by the Display Department of the Consolidated Edison Co. In addition to the sales staffs of the exhibiting appliance manufacturers, representatives of Consolidated Edison Co. as well as of the Industrial and Commercial Gas Section of the American Gas Association were on the floor at all times. An unusually large number of representatives from gas utility hotel and restaurant sales divisions attended the Show from Chicago, Washington, Cincinnati, Brooklyn, Milwaukee, Detroit, Allentown, Springfield, New Haven, Newark, and other urban centers.



Left:—J. F. O'Donnell, American Stove Co., New York City, demonstrates his company's ingenious new broiler to F. J. Shields, New Haven Gas Light Co., New Haven, Conn., and E. P. Ashdown, New Haven Gas Light Co.
Right:—(from l. to r.) T. J. Gallagher, Mgr. Comm'l. Dept., The Peoples Gas Light & Coke Co., Chicago; W. D. Crouch, Mgr., Comm'l. & Ind'l. Div., Robertshaw Thermostat Co., New York; James F. Pitman, Sales Mgr., J. C. Pitman & Sons, Inc., Lynn, Mass.; E. V. Fineran, Mgr., Ind'l. Dept., Washington Gas Light Co., Washington; Bayard D. Evans, Evans Coffee Shop, Arlington, Va., discuss batch doughnut frying.

New Equipment and Appliances

Fisher Type 630 Regulator

The Fisher Governor Company, Marshalltown, Iowa, are now marketing their new Type 630 Regulator. This unit is for high and intermediate gas pressure reduction such as the primary reduction of pressure in farm taps from high pressure transmission lines. Also for general applications in refineries and gasoline plants.

Fisher Type 630 Regulator

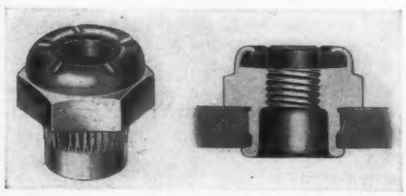
The pressure loading feature built into this valve makes it possible to maintain automatically the reduced pressure at the set point regardless of fluctuations in inlet pressure and increases in demand load.

Large and small diaphragm assemblies for reduced pressure ranges of 0 to 30 lbs. and 25 to 150 lbs. respectively are available. They are interchangeable on all sizes.

Sizes 1", 1¼", 1½" and 2" with three orifice size ¼", ⅜" and ½". Suitable for inlet pressures up to 1,000 lbs. per square inch and for reduced pressure range of 2 to 150 lbs. per square inch. For full description, Bulletin 43D.

Elastic Stop Nut

For fastening sheet-metal assemblies in which the parts must be readily removed and returned to position, a clinch type of self-locking nut with knurled shank is offered by Elastic Stop Nut Corporation, 2332 Vauxhall Road, Union, New Jersey.

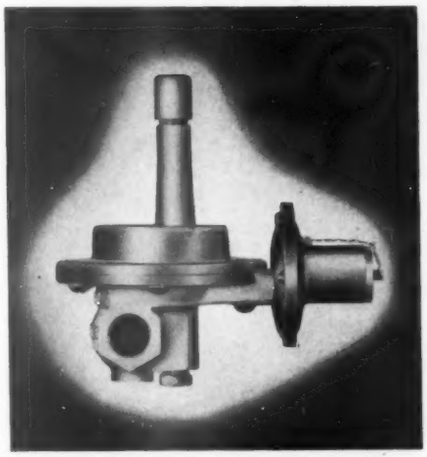


To install the nut, a hole is drilled in the structure and the shank is pressed into the hole. The mouth of the shank is then spread against the back of the structure to effect a clinching hold. The knurling engages the drilled surface and thus assists in eliminating any turning of the nut.

Available in a complete range of sizes, thread systems, shank lengths, and materials.

"Security" Cut-off Valve

A new automatic, low pressure cut-off valve for gas services from ¾" to 1¼" that remains positively closed under any conditions has been introduced by the Security Valve Corporation, Los Angeles.



"Security" Valve

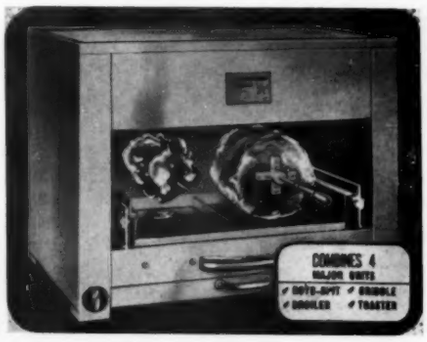
The patented feature of this valve is that the diaphragm control and valve seat are disassociated as soon as the valve operates from lack of pressure.

When gas pressure is returned to the line, this "Security" valve can be easily re-set, either by the tenant or the gas company, by simply removing the cap and lifting the plunger that sets the ball on the pedestal.

The valve operates by a sensitive diaphragm, set to any predetermined pressure. As long as the gas pressure is maintained, this diaphragm holds back the plunger rod. When the pressure drops to a predetermined point, the spring releases the plunger rod and the ball drops from the pedestal to close the gas inlet. As the valve seat is completely separated from the diaphragm control, once the valve has operated, returning pressure can only increase the tightness of the seal. The valve cannot be reset manually until gas is again returned to lines.

Masterchef Roto-Broiler

To meet the demands for a combination appliance that would roast, broil, fry and toast and still use as little counter-space as one unit, Masterchef Products, Inc., 509 Fifth Ave., New York, has introduced the new Counter-Speed "Roto-Broiler".



Masrerchef Roto-Broiler

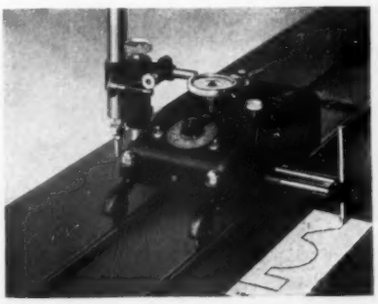
The broiler is equipped with noiseless driving mechanism for operation on standard voltage, while removable, steel rotary spits provide ample space for chickens, roasts and barbecued meats. In addition it incorporates the broiler, griddle and toaster regular equipment on all standard Counter-Speed Broilers.

By utilizing patented ceramic burner units, gas consumption is cut to only 30 cu. ft. per hr.

Full description and time tests in their booklet "Savory Profits".

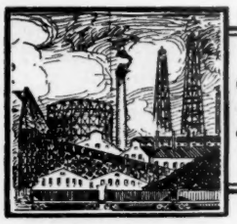
Portable Cutting Machine

The Harris Calorific Co., Cleveland, Ohio, announce their improved Model "K" Portable, Motor-Driven Gas Cutting Machine. This



Model K Cutting Machine

is an efficient unit for cutting steel of light or heavy section.



News of the Gas Industry

Gas Customers Gain in First Eight Months

Customers served by manufactured and natural gas utilities totalled 17,637,300 on August 31st, an increase of 425,700 over the number reported on the same date a year ago, it was announced today by Paul Ryan, Chief Statistician of the American Gas Association.

Revenues of manufactured and natural gas utilities aggregated $587,796,500 for the first eight months of 1940. This was an increase of 7.3 per cent over the corresponding period of 1939.

Revenues from domestic customers gained 6.8 per cent, while revenues from industrial and commercial uses rose 8.4 per cent.

Manufactured gas industry revenues totalled $254,453,600 for the first eight months, an increase of 4.4 per cent from a year ago. Revenues from commercial sales of manufactured gas gained 4.0 per cent, while industrial revenues were 10.5 per cent more than for the corresponding period of 1939. Revenues from domestic uses such as cooking, water heating, refrigeration, etc., were 1.3 per cent more than for a year ago.

Revenues of the natural gas industry for the first eight months aggregated $333,342,900 a gain of 9.6 per cent from a year ago. Revenues from industrial uses increased 8.4 per cent, while revenues from domestic uses rose 9.9 per cent.

During the eight months ending August 31st, some 118,397,900,000 cubic feet of natural gas were used in generating electric power in public utility steam plants throughout the country.

New Home Building Hits Ten Year Peak in 310 U.S. Cities

New home construction in 310 leading American cities in 1939 totaled the highest in value and volume in ten years, according to the annual national home building survey of Investors Syndicate recently completed.

"Volume of new homes last year was more than ten times (10.4) the 1934 total, the low for the decade. Value of these new residences was almost ten times (9.8) the low total hit in 1934."

Contributing substantially to these record-breaking figures was the smallness of the advance, only four-fifths of one per cent, in average cost per person provided with new housing over the preceding year.

The cities included in the survey, located in 41 states and the District of Columbia, have a population, according to the 1940 preliminary estimate of the U. S. Bureau of Census, of 49,134,705, or 37.4 per cent of the population of the United States. This group includes the 92 cities with a population of 100,000 or more.

New home building in 310 American cities in 1939 provided housing for 867,664 people. This was a gain of 202,032 people, or 30.4 per cent, over the 665,632 newly housed in these same cities in 1938. New residential construction last year in these same cities provided for 67.1 per cent more people than in 1930, when only 519,192 were newly sheltered.

"The average cost per person supplied with new housing in these 310 cities in 1939 was $920.35, a rise of $7.55, or four-fifths of one cent, over the 1938 average of $912.80. Last year's cost of new housing per person, however, was $215.54, or 19 per cent lower than the 1930 average of $1,135.89."

East Ohio Gas Company Elects J. French Robinson President

J. French Robinson, Pittsburgh, has been elected president and a director of the East Ohio Gas Company, Cleveland. He succeeds Charles E. Gallagher, Cleveland, who has been elected chairman of the board. Mr. Robinson takes up his new duties at once.

Mr. Robinson has been president of Peoples since 1936, when he succeeded the late J. B. Tonkin, who retired.

Mr. Robinson, now 50, is a native of Elizabeth, W. Va., where, as a boy, he assisted his father in the operation of a gas plant.

After attending public schools in Elizabeth and West Virginia Preparatory School in Morgantown, he was graduated from West Virginia University in 1915 with the degree of Bachelor of Science in Civil Engineering.

While in the university and after graduation he worked as assistant geologist for the Baltimore and Ohio Railroad Company until 1918, when he went with the Ford Run Franklin Coal and Coke Company in West Virginia as engineer and superintendent. That year he received a Master of Science degree at West Virginia University. He left in 1919 to become geologist and engineer for the Seneca Hill Oil Company in the southwest.

He was appointed assistant state geologist for Pennsylvania in 1920. He left a year later to join The Peoples Natural Gas Company as geologist and engineer. He also was associated with affiliates of Peoples in Ohio, West Virginia, Kentucky, Tennessee and Pennsylvania.

During this period he made a two-year study of the various sand horizons in the Appalachian field which required the study of 15,000 wells in Pennsylvania, Ohio, West Virginia, and Kentucky. For this work the University of Pittsburgh gave him the honorary degree of Doctor of Science in 1929.

Since 1930 he has been manager of the Lycoming Producing Corporation, New York State Natural Gas Corporation and Keuka Construction Corporation. Mr. Robinson was elected vice-president of The Peoples Natural Gas Company and The Columbia Natural Gas Company in 1933, and was made president of both companies in 1936. Under his direction, Columbia has since been consolidated with Peoples.

Mr. Charles E. Gallagher, who becomes Chairman of the Board of The East Ohio Gas Company, is a veteran of over forty years service with that company.

He was manager of its Youngstown division before coming to Cleveland, Assistant General Manager in 1926, becoming President and General Manager in 1933.

Mr. Gallagher is also a Director of the American Gas Association and is well known for his interest and activity in civic affairs.

Roland S. Child Appointed Chairman A.G.A. Committee on Personnel Practices

Roland S. Child, personnel manager of The Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y., has been appointed chairman of the Committee on Personnel Practices of the American Gas Association by T. J. Strickler, president of the Association.

This committee is now in its fifth year as an Association activity and is engaged in a continuing study of the industrial relations problems of the gas industry.

As a member of the committee for several years, Mr. Child has made important contributions to its work. An expert on pensions and thrift plans, Mr. Child made an authoritative study of employee pension plans in 1937 which was included in the committee's annual report and published in the February, 1938, issue of the American Gas Association Monthly. This study covered the introduction of the Federal Social Security plan and previous experience of the Central Hudson Gas & Electric Corporation with various public and private pension systems.

Mr. Child has been in charge of personnel work for The Central Hudson Gas and Electric Corporation since 1932 and has been associated with that company since 1920.

E. M. Borger Becomes V.P. of Peoples Natural Gas Co.

Edward M. Borger has been elected president of The Peoples Natural Gas Company, Pittsburgh, to succeed J. French Robinson who has resigned to become president of the East Ohio Gas Company, Cleveland.

The announcement was made by Mr. Robinson at a farewell dinner in his honor by employes of the company at the Pittsburgh Athletic Club, Nov. 15th. Lawrence E. Ostrye, superintendent of distribution for the company, acted as toastmaster.

Edward M. Borger

In revealing the name of his successor Mr. Robinson said: "I am particularly glad that Mr. Borger is to succeed me. He has been one of my principal aides in the general management of the company for a number of years. His entire business life has been spent with Peoples and his experience has brought him in touch with every phase of the natural gas industry and of gas service."

Mr. Borger was employed as an attorney for The Peoples Natural Gas Company, and affiliated companies in 1922, following his graduation from Duquesne University. Since 1935 he has been general counsel for the company and for the Hope Natural Gas Company, New York State Natural Gas Corporation and affiliated companies.

Brewer Appointed Secretary of A.G.A. Accounting Section

Orville W. Brewer, a member of the American Gas Association headquarters staff since April 1921, has been appointed Secretary of the Association's Accounting Section, as of November 1st, according to an announcement made by Alexander Forward, Managing Director of the Association. Mr. Brewer succeeds the late Hugh W. Hartman.

During his affiliation with the Association Mr. Brewer has been in charge of its finances, with the title of Auditor.

Previous to joining the staff, he was engaged in public and private accounting, and was for several years connected with the Public Service Electric & Gas Company of New Jersey.

He was active in the organization of the Controllers Institute of America, a member of the Executive Board, and is now serving the Institute as Treasurer. He is also a member of the National Association of Cost Accountants, the Accountants Club, and the New York Society of Accountants.

Tappan Elected Chairman of Manufacturers Group

Alan P. Tappan, vice-president of the Tappan Stove Co., of Mansfield, Ohio, has been elected chairman of the Domestic Gas Range Division of the Association of Gas Appliance and Equipment Manufacturers, the group sponsoring the nationwide sales promotion program in behalf of "CP" (Certified Performance) Gas Ranges. This was announced from the Association's national headquarters in New York City.

Mr. Tappan has long been active in the gas industry and in the affairs of the Association. In 1938 he was chairman of the Sales Management Committee of the range division responsible for the launching of the "CP" program.

The appointment of W. D. Antrim, of the Roberts & Mander Stove Co., of Hatboro, Pa., as chairman of the Specifications Committee for Improvement of Gas Ranges, was also announced.

Lloyd C. Ginn, sales promotion manager of the American Stove Co., Cleveland, will serve for a second year as chairman of the Association's "CP" Sales Promotion Committee. Other members of this committee include: John A. Fry, president, Detroit-Michigan Stove Co.; D. P. O'Keefe, president, O'Keefe & Merritt Co., Los Angeles; Frank J. Hoenigmann, vice-president, Cribben & Sexton Co., Chicago; E. J. Kanker, manager, Range Sales, Norge Division, Borg Warner Corp., Detroit; Malcolm Leach, vice-president, Glenwood Range Co., Taunton, Mass.; Lucian Kahn, vice-president, Estate Stove Co., Hamilton, Ohio; H. S. Minster, president, Roberts & Mander Stove Co., Hatboro, Pa., and W. E. Bradbury, Newark Stove Co., Newark, Ohio.

Abrams Appointed Advertising Director for "CP" Gas Ranges

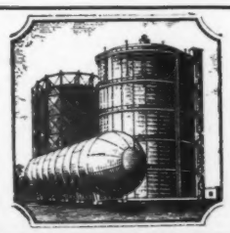
The appointment of James R. Abrams as advertising director of the Domestic Gas Range Division of the Association of Gas Appliance and Equipment Manufacturers has been announced by Lloyd C. Ginn, chairman of the Association's "CP" Sales Promotion Committee.

Mr. Abrams, who since 1933 was associated with Congoleum-Nairn, Inc., will assist in the promotion of "CP" (Certified Performance) Gas Ranges now being carried on nationally by the Association. His appointment becomes immediately effective. He will serve under R. S. Agee, sales promotion manager of the Range Division, with headquarters in New York City.

James R. Abrams

With twenty-six leading manufacturers located throughout the United States and Canada now producing "CP" ranges and a co-operative budget of $115,000 having been appropriated by the manufacturers for 1941 "CP" promotion to tie-in with the American Gas Association's half million dollar national advertising program, a concerted educational and sales stimulating drive is now under way for the "CP" product. The campaign enlists the support of all gas operating companies as well as several thousand retail dealers.

Mr. Abrams has had wide experience in newspaper, advertising agency and sales promotion work. He has edited trade publications and written many articles on merchandising. During his association with Congoleum-Nairn, he addressed many department store executives and sales groups throughout the country.



STACEY BROTHERS

Gas Construction Co., Inc.

"STACEY-KLONNE" & TELESCOPIC GAS HOLDERS "STACEY BULLET" PRESSURE HOLDERS
PURIFIERS AND STEEL PLATE CONSTRUCTION

Executive Offices:
Cincinnati, Ohio

Eastern Office:
21 West St., N. Y. C.

Application for Approval or Listing Revised

Manufacturers' Suggestions Adopted, Become Effective January 1, 1941

On December 2, 1940, Application for Approval or Listing forms for the calendar year 1941 were distributed to all manufacturers of gas appliances and accessories, as well as to dealers to whom extensions of approval have been granted by the Testing Laboratories. In order that products of these manufacturers and dealers may be listed in the January 1, 1941, Directory of Approved Gas Appliances and Listed Accessories, these applications must be duly signed and returned to the Laboratories on or before that date.

Of particular interest to all applicants are two modifications of the current Application, both of which emanated from suggestions originated by appliance manufacturers and endorsed by the Board of Directors of the A.G.A. E.M. To avoid confusion between products manufactured for sale under a dealer's name, with those sold under the manufacturer's own trade mark, it was suggested that name plates of the former bear the additional wording: "Manufactured For." This suggestion was subsequently approved by the Laboratories Managing Committee.

In order that this practice may be made effective immediately and without undue inconvenience to manufacturers or dealers, the Laboratories Managing Committee agreed to include an appropriate clause to cover it in the 1941 Application for Approval or Listing. New dealers requesting Certificates of Approval for approved equipment manufactured for sale under their name and who have had no previous business with the Laboratories will be required to include the phrase "Manufactured For" on their name plates immediately. Dealers who wish to renew existing certificates will be asked to comply therewith as soon as convenient, and not later than January 1, 1942. The new ruling does not affect manufacturers producing equipment for sale exclusively under their own name or trade mark. However, where they do produce appliances marked with the dealer's name, they are requested to apprise these dealers with the intent of this revision.

The second revision to the Application for Approval or Listing relates to the dating of Certificates of Approval covering appliances tested for compliance with requirements in advance of their effective date. Due to the fact that each successive edition of the various approval requirements usually embodies more rigid specifications than those it supersedes, as well as the fact that new standards do not become effective until nine months after they have been distributed to the industry, it was proposed that some means be adopted to encourage manufacturers to comply with these latest standards before they became mandatory.

REED'S 4 WHEEL
Razor Blade Pipe Cutters

IDEAL FOR ANY TRENCH OR OTHER CLOSE QUARTER JOBS

$4.20 F. O. B. ERIE

Capacity
½" to 2"
Weight 5 lbs.

The REED FOUR WHEEL Cutter operates with a short back and forth motion through only one third of a circle. Each of the four wheels exerts the same pressure on the pipe, and all 4 therefore cut evenly and completely through the pipe at the same time.

Equipped with Reed special alloy RAZOR BLADE Wheels, which cut with remarkable ease, leave little burr, and have a long life of useful service.

A sample cutter for test and trial may be ordered on memorandum invoice, to be paid for if retained or returned for credit if unsatisfactory. Try it once, and you will use no other.

REED MFG. COMPANY
1436 W. 8th Street • ERIE, PA.

Pipe Line Bonds for Cathodic Protection

Cooperative Investigation of National Bureau of Standards and American Gas Association

The cheapest and most dependable bond for use in the cathodic protection of pipe lines is being sought in an investigation at the National Bureau of Standards sponsored by the American Gas Association.

A metal pipe line buried in the ground may set up a condition similar to that in an electric battery; a weak current flows, and where it leaves the pipe to enter the soil, the metal becomes corroded. In some cases this corrosion is serious. This condition can be prevented by the use of a counter electromotive force, the method known as "cathodic protection," having come into extensive use during the last few years. This protection is only possible if any high resistance joints in the pipe are bridged across by a good conductor; otherwise, it is not possible to keep any great length of the pipe line at the same potential, and this is essential for its protection. Bonds, as they are called, are, therefore, used but most of them do not meet all requirements of satisfactory performance, easy installation and low cost.

Dr. Scott Ewing, research associate of the American Gas Association at the Bureau has investigated the methods that might be used to attach copper bond wires to steel pipes. This involved reviewing the experience of railroads in bonding rails, investigating the methods of soldering, brazing and welding, and obtaining information from pipe-line engineers on their bonding experience.

Although soldered joints have less strength than those made by any other method, and they have been unsuccessful on electric railroads, they have been satisfactory on many cathodic protection systems. More difficulty has been experienced on pipe lines with brazed joints than with any other type. Copper strips, welded to the pipe, have been used and they have been entirely satisfactory. While any of the above methods of joining will probably be satisfactory if the work is properly done, the cost of installing the bonds is likely to be high, and with some methods it is extremely difficult to make a good joint in the field.

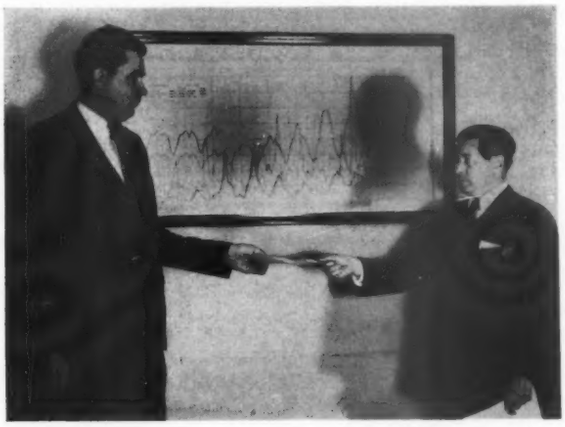
Dr. Ewing believes that a cheaper and more dependable bond can be obtained by the use of steel terminal copper bonds than by any other means. Tests are now being made from which it is believed that such a terminal will be devised. These bonds can be manufactured by methods similar to those used for rail bonds, and if the demand for them is sufficient, their moderate price should make the total cost of the installed bond lower than that of any other type.

Pittsburgh Coal Co. Appoints C. E. Ash Jr.

Pittsburgh Coal Company, Pittsburgh, Penna., has just announced the appointment of Mr. C. E. Ash, Jr., as sales agent for that company, with headquarters at Albany, N. Y.

W. R. Peterson Wins Annual Award

William R. Peterson, of the Minneapolis Gas Light Company, Minneapolis, Minn., is the winner of the $50.00 annual award established by the Personnel Practices Committee of the American Gas Association for the year's outstanding student in the home study course in American Gas Practice at Columbia University. The selection of Mr. Peterson as the prizewinner was made upon the recommendation of Professor Jerome J. Morgan, of Columbia University, who conducts the gas course. H. L. Donaldson, of The Equitable Gas Co. of Pittsburgh, Pa., is chairman of the Committee making the award.



William R. Peterson (on left) receives the Award from H. K. Wrench, V.P. and Gen. Mgr. Minneapolis Gas Light Co.

This $50.00 prize, which is similar to an award made in connection with the home study course on Natural Gas at the University of Kansas, is derived from the Trustees Gas Educational Fund established some years ago for an educational purpose of value to the gas industry. The present award was established two years ago to "stimulate the interest of the younger men to acquire more knowledge of the gas industry."

Mr. Peterson enrolled in the course in American Gas Practice in July 1939, and completed both Parts I and II of the course in May 1940. The first part of the course, deals with the production of manufactured gas and the second is devoted to the distribution and utilization of gas.

Laboratories' Engineer Joins Lennox Furnace Co.

On November 1, 1940, Mr. H. L. Shufflebarger resigned from the American Gas Association Testing Laboratories to take up new duties with the Lennox Furnace Company of Columbus, Ohio.

Employed in the Laboratories in various capacities, Mr. Shufflebarger secured a thorough training in the testing of different types of appliances, particularly central heating equipment. This experience affords him an excellent background for his new responsibilities as Development Engineer with the Lennox Furnace Company. His previous training was at Ohio State University where he received his degree in mechanical engineering.

Mr. Shufflebarger is the 114th engineer to undertake other duties in the gas industry after a preliminary training at the American Gas Association's Testing Laboratories. He brings the total number of former Laboratories' engineers who are now actively engaged in various branches of the gas business to 63. It is interesting to report that 37 former Laboratories' engineers are now employed by manufacturers of gas appliances, 7 by accessory manufacturers and 9 by gas utilities.

Lyle C. Harvey Elected Director of Dresser Manufacturing Company

Lyle C. Harvey, president and general manager, The Bryant Heater Company, Cleveland, Ohio, has been elected to the Board of Directors of Dresser Manufacturing Company, Bradford, Pa., according to an announcement made on September 20 by H. N. Mallon, president.

Mr. Harvey, identified with the gas industry for the past two decades, particularly in the gas-appliance field, is responsible for many innovations in the merchandising of gas-heating and air-conditioning appliances. He became head of The Bryant Heater Company, a wholly owned subsidiary of Dresser Manufacturing Company, on March 22, 1938, after serving as vice president from June, 1933, the date of Bryant's acquisition. Dresser Manufacturing Company, the parent company manufactures Dresser pipe couplings and pipe-line repair devices.

Synthetic Diaphragms

An attractive six-page folder on gas meter and regulator diaphragms, for manufactured, natural, and petroleum gas, is being distributed by the Vulcan Proofing Company, Brooklyn, N. Y., manufacturers of Vulcan non-leather diaphragms. The folder illustrates a number of diaphragms furnished for various equipment manufacturers. The advantages claimed for these new diaphragms are illustrated and described in detail including a side-by-side comparison of the seams in leather and non-leather diaphragm loops, the latter being vulcanized rather than stitched.

The manufacturers of Vulcan diaphragms state: "Because leather diaphragms had been employed exclusively for many years throughout the industry, it was only natural that Vulcan diaphragms should at first be received with some degree of skepticism. The logical procedure, therefore, was to have these new diaphragms tested by leading utility companies in actual service—and this was done. As a result, Vulcan diaphragms now have a very substantial background of successful performance over a period of years."

The descriptive folder will be mailed on request.

Lyle C. Harvey

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Z "HANDLE & LOCKING SLEEVE
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Consolidated Edison Co. Announces Administrative Changes

At a meeting of the board of trustees of Consolidated Edison Company on November 25th numerous changes in the organization were made to bring about further combination of electric and gas operations of the company. William Cullen Morris, vice-president in charge of gas operations, and Howard W. Leitch, vice-president in charge of electric operations, who have passed the company's retirement age, were relieved of administrative duties. They will act hereafter as consultants on special assignments from the president.

Three new vice-presidents were elected. Hudson R. Searing, engineer of operation in the electric field, became vice-president in charge of Electric and Gas Operation and Electric Production. James F. Hunter, assistant vice-president, became vice-president in charge of Technical Service and Gas Production. Leland B. Bonnett, engineer, design and planning, became vice-president in charge of Design, Inventory, Purchasing and Stores.

Six new assistant vice-presidents were elected: Harland C. Forbes, System engineer in the electric field, was made assistant vice-president for Research, Development and Planning. Porter C. Savage, purchasing agent, and James F. Fairman, electrical engineer, became assistant vice-presidents for Design, Inventory, Purchasing and Stores. George L. Knight, engineer of construction and vice-president of Brooklyn Edison Company, and Earl L. Griffith, engineer of gas maintenance and construction, were made assistant vice-presidents for Construction and Shops, and Colin C. Simpson, engineer of gas distribution, became assistant vice-president, Operation and Electric Production.

The effect of these promotions and changes in duties is to bring together at the top of the various functional divisions of Consolidated Edison System men whose experience has been in the electric or gas fields of operation, leaving only one such division, gas production and holder stations, which will handle matters in the gas end of the business alone.

These changes became effective December 1.

Manual on Pipe Repairs, Service Fittings, Drilling Methods and Equipment!

Gas men everywhere will welcome the new and larger Skinner Catalog No. 41, just released, according to the M. B. Skinner Co. This catalog represents an entirely new venture in the field—being virtually a 40-page manual on repair clamps, service fittings, drilling methods and equipment.

Larger in size (8½" x 11"), and profusely illustrated, it contains a world of useful information, complete dimensions, installation instructions, and original data never before published.

Attractive plastic binding makes it lie flat when opened up to any page spread. New "Skinner-Seal" items not previously cataloged include Non-Shift Service Saddle, Bull-Neck Street Tee, Forged Welding Tee, Welding Tube, and various Drilling Devices, Cutters and Adapters. A series of valuable tables show the ten most widely used Service Methods, with data on equipment recommended for various sizes of tees, saddle outlets, pipe nipples, and tubes.

Copies may be had by writing M. B. Skinner Co., South Bend, Indiana.

James F. Hunter

Leland B. Bonnett
Photo Blackstone Studios

Hudson R. Searing
Photo Blank & Stoller

New Sales Appointments of Detroit-Michigan Stove Co.

Detroit-Michigan Stove Company of Detroit announces a new field alignment, with four sectional Sales Managers in charge of territorial divisions. The divisions are Eastern, Southwestern, Central and Northwestern.

C. M. Jewell, former District Manager for Detroit-Michigan in the New York area, is now Sales Manager of the Eastern Division, with headquarters at Syracuse, N. Y.; Paul Inskeep, former Regional Sales Manager, is Sales Manager of the Central Division, with headquarters at the main office in Detroit; J. M. Little, former District Manager in Texas, is Sales Manager of the Southwestern Division with headquarters at Dallas, Texas; K. S. Gray, former District Manager in Iowa and Nebraska, is Sales Manager of the Northwestern Division, with headquarters in Omaha, Nebraska.

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LEON B. EICHENGREEN

Leon B. Eichengreen, Vice-President of the Philadelphia Electric Company in charge of gas operations and properties, died Sunday evening, November 10, after a brief illness. He was 56 years of age, and a native of Clay Center, Kansas.

LEON B. EICHENGREEN

After graduating from the University of Pennsylvania as a mechanical engineer, he entered the employ of the United Gas Improvement Company, on March 1, 1909. A series of promotions followed until, in 1923, he was made General Superintendent of Gas Operations. He was appointed Manager of the Gas Department of the Philadelphia Electric Company in 1928, and was elected Vice-President of the Company in 1937.

Mr. Eichengreen was a director of the American Gas Association as well as a past-president of the Pennsylvania Gas Association.

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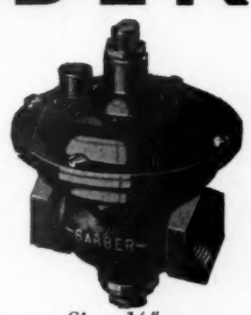

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Randall M. (Duffy) Lewis, Mgr.

National Defense

(Continued from page 11)

little to offer excepting a fuel, and many times we could not even offer that in the amounts required by a program of such magnitude. Since then, viewed from a nation-wide perspective, we have multiplied our production, transmission, and distribution facilities many many times, to the end that practically all of our major industrial centers are adequately served. Where we had few, if any specialists then in the art of proper and economical utilization, we now have thousands of industrial engineers trained and experienced for the task we face. In cooperation with industry and equipment manufacturers, we have helped evolve and develop new processes and methods which, when applied to the instruments of modern warfare, make possible the superlative qualities expected for use with our modern Army, Navy, and Air Corps.

That we shall give to this program promptly, and with limitless effort, what we so clearly have to offer in service facilities and experienced training, constitutes a continuing challenge to the Gas Industry.

May I say, in closing, that with all the imaginative and creative ability of which we are capable, backed with all the initiative, enthusiasm, and determination necessary to reach our Defense objectives, the **American Gas Industry Accepts This Challenge!**

Combustion Characteristics of Fuel Gases

(Continued from page 35)

tributed. Thus, if h is reduced from the average normal of 540 to 520, then d would have to be reduced from .500 to .464 to maintain B = 69 for both gases.

With respect to the relation of gas composition to burner number, the total fraction of CH_4 + Ill. in the mixture appeared to be the best indication. Suitable mixtures interchangeable with those distributed in this locality may contain as little as 25 per cent or as much as 33 per cent CH_4 + Ill. Average mixture should contain close to 30 per cent. The relationship between the test burner number and gas composition for mixtures containing between 18 per cent and 35 per cent CH_4 + Ill. is expressed as follows:

B = 4 X — 52, X = total % of CH_4 + Ill., B = Burner number. This formula should be applied to industrial manufactured gas mixtures or to similar mixtures which contain less than 10% natural gas, and then only with reservation. It appears to hold quite well for the gases listed in this paper.

Since the purpose of the test burner is to provide a comparison of cone-forming properties of different gases on a burner, it may be desirable to convert test burner readings into cone height measurements. This can readily be accomplished by the following equation. Direct readings are not usually made because of the difficulty of accurately locating the tip of the inner cone. Primary air shutter readings can be made much more definitely.

CH = .02 B — .40, CH = cone height in inches

B = burner number from 40 to 120.

If the normal gas corresponds to the average city gas distributed in this locality, then the cone height may be expressed as a per cent of the normal by the expression: CH = 2 B — 40, CH = % of normal cone height, for the same range of B as indicated before.

The authors wish to express their appreciation to the Rochester Gas and Electric Corporation for the privileges afforded them to carry out this study.

Moving a Gas Holder

(Continued from page 38)

Springs to the proposed new site.

For moving, the holder was jacked onto a special cradle platform constructed of 20 60-foot steel I-beams, with the holder's sides supported by eight 20-foot H-bar uprights. The rollers which moved the load along the tracks were of orange wood, which, according to Mr. Kress, has a fiber and compression strength beyond any other type of wood.

The track was built in 300 foot sections and was pulled and moved forward of the holder each day. The load was drawn by a 7-ton Fageole truck equipped with a double-reduction gear, anchored to redwood "deadmen," sunk eight feet into the desert soil. Eight lines of 5/8ths inch cable operated through a winch on the truck moved the heavy load at a rate of 250 to 500 feet per day. Average progress was 300 feet daily. It took six weeks to complete the actual moving; three months for the entire job.

Palm Springs has a winter population of 6,000; a summer population of about 300. Gas is the exclusive fuel for heating and cooking. Despite its desert location, Palm Springs requires heat on most winter nights, for the range of winter temperatures is from 95 deg. F. during the day to below 30 degrees at night. Forced air gas heating units predominate in the numerous palatial winter homes for which the town is noted. According to James T. Van Rensselaer of the Southern Counties Gas Co. gas serves the purpose of desert heating more efficiently than other types of fuel because it provides the quick, ready heat desirable for areas where heating is required only for short periods at a time. It is ideal for desert districts, he added, because gas supplies a large volume of heat in a short time.

Cooperative Sales Activities

(Continued from page 8)

be purchased for use in federal housing projects, defense housing projects, etc. I feel that this close cooperation will enable gas appliance manufacturers to secure an adequate share of the business represented by these markets.

In closing I would like to briefly again emphasize the productive results that can be achieved through united cooperative activity. The word "unity" is in popular use today and it can be applied just as directly to our business as it can be applied to any other business or the nation as a whole. I feel that we have attained an encouraging degree of this "unity" and it seems to me that prospects for the future are favorable. It is impossible to measure accurately the results of cooperative effort but the progress of our business over the past several years warrants a continuance of such cooperation.

Consolidated Edison Co. Grants Military Leave Allowances

Announcement has been made by Consolidated Edison Company of New York and its affiliated companies—Brooklyn Edison Company, New York and Queens Electric Light and Power Company, Westchester Lighting Company, The Yonkers Electric Light and Power Company, New York Steam Corporation and Consolidated Telegraph and Electrical Subway Company—that the companies will grant a military leave of absence to employes called for service under the National Guard Act, or drafted, and also to those of draft age who volunteer for service not longer than that required by the Draft Act.

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